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THE UTILITY OF THE CASONI REACTION IN THE DIAGNOSIS OF HYDATID DISEASE.¹

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THE occurrence of urticaria, erythema and other symptoms suggestive of anaphylaxis following the rupture of hydatid cysts, directed attention to the presence of skin sensitiveness in cases of hydatid infestation. Casoni in 1911 first made use of this phenomenon as an aid to diagnosis and devised a test in which 0.5 cubic centimetres of filtered and carbolized hydatid fluid was injected intradermally. When such an injection is made, within ten minutes the small pigskin area of the injection increases in size till it becomes a large wheal with spider-like outrunners, surrounded by a wide zone of erythema. After an hour or so the wheal fades. This early phase of the reaction is after the course of six or eight hours replaced by a second in which there is a very large area of erythema associated with infiltration and oedema of the subcutaneous tissues. This area round the site of the injection which is

usually made in the arm, may have a definite edge and may extend over the greater part of the arm and forearm. There is no tenderness in the regional lymph glands and apart from some itching and heat and a slight aching of the affected limb, the patient does not complain.

All the early workers, including K. D. Fairley in this country, concentrated their attention upon this late phase of the reaction and until this year we have been unable to find in the literature any reference to the study of the early phase of the reaction. For rather more than a year Mr. Dew, Miss Williams and I have paid particular attention to the early wheal. This seems to be almost invariably present when the result of the test is positive, whereas the delayed reaction is frequently absent immediately after operation and in cases of suppuration. In this last type of case almost all the earlier workers reported failure to obtain results in the Casoni test on this account.

The skin reaction has, however, two great disadvantages from a diagnostic point of view. In the first place there is the difficulty caused by the occurrence of pseudo-positive results. This is met with particularly in cases of jaundice with pruritus and in those of generalized skin disease or in patients with a tendency to urticaria resulting from some form of protein sensitiveness. In a haemo-

¹ Read at a meeting of the South-Western Division of the Victorian Branch of the British Medical Association on March 7, 1925.

philic boy a positive result was not corroborated at operation, when the suspected tumour proved to be a haemato-ma, though a deep-seated cyst was not excluded.

Since the fluid used for the test is obtained from the cysts of sheep, the possibility exists that some patients sensitive to sheep protein may give a skin reaction from this cause. The second disadvantage of the test is that skin sensitiveness to hydatid protein persists for many years, so that as far as our present knowledge goes the test cannot be relied upon to give information concerning recurrence in patients who have had hydatid disease in the past. In these cases the complement fixation test is indispensable.

The intradermal test has its most important application in the diagnosis of cases in which no operation has been performed and in which there is no previous history of the disease. In this group of cases it gives more than 90% of reactions.

In carrying out the test we inject 0.2 cubic centimetre of filtered hydatid fluid obtained from cysts in the sheep. Fluid which is turbid, is discarded and we are always careful to use pooled fluid which is collected aseptically, free from any trace of blood and filtered through a Berkfeld filter and incubated to ensure its sterility. As a control physiological saline solution is injected in similar dosage into the skin of the same arm four to five centimetres or so away. I do not propose to discuss the interesting immunological questions which have been raised by the study of the skin reaction in conjunction with the complement fixation and precipitin reactions. The primary wheal seems to be present in nearly all cases of hydatid disease whether they are above or below the diaphragm and whether or no there is a response to the complement fixation or precipitin test. It appears to be unaffected by any large excess of circulating antibody, if this be indicated by a high complement fixation or precipitin titre of the patient's serum. It is likewise unaffected by anti-anaphylaxis set up by causing free hydatid protein to circulate in the blood stream. We have interesting evidence to offer in support of this last statement. Mr. Dew has operated on a small series of patients in whom a small amount of fluid has been spilt at operation and the skin reaction has been studied before and at various times afterwards. In some of these a delayed reaction which was present before, has disappeared to reappear a few weeks later; in others this response which was not present before operation, has appeared within twenty-four hours. In no case has there been any change in the primary wheal, which has neither increased nor diminished in extent as a result of the operative procedures.

The second line of evidence results from experiments upon myself. On January 20 of this year no result was obtained to a skin test and on that date and every third day five cubic centimetres of hydatid fluid were injected subcutaneously till twenty cubic centimetres had been administered. Eight days after the first injection a definite

primary wheal was obtained, but no delayed reaction and no response was obtained to the complement fixation and precipitin tests. Three days later there was not only a primary wheal, but also a definite delayed reaction. This tendency to produce a delayed response as well as a primary wheal had disappeared within a fortnight, but a subcutaneous injection of one cubic centimetre of fluid on February 23 gave an enormous reaction of the delayed type. The presence of free circulating antigen did not interfere in the slightest degree with the appearance of a primary wheal in response to the injection of 0.2 cubic centimetres of fluid intradermally twenty-four hours later.

A point of considerable practical importance is as to whether the primary reaction occurs or not when the test is carried out on an anaesthetized subject. Our observations lead us to advise against using the test under these conditions as in three out of five persons with a well marked primary wheal before operation the test yielded no reaction when carried out during anaesthesia.

It is possible that the test may in the future be found to be of use in the diagnosis of recurrent or residual cysts, as in some post-operative cases the absence of a delayed response some time after operation appears to be associated with this type of reaction. We have not as yet sufficient evidence on this point.

In all post-operative cases, that is in those persons with an earlier history of cured hydatid disease, the complement fixation reaction is still our most valuable indication of the presence of cysts left behind at operation or of cysts which have since appeared. There are still a large group of persons with cysts in the brain, lung or skeletal musculature who do not as a rule give complement fixation reactions. The serological diagnosis of the disease in children is also still far from perfect

THE DIAGNOSIS OF URINARY STONE AND HYDRONEPHROSIS.¹

By J. T. TAIT, M.D., M.S. (Melbourne).
Melbourne.

THE development of exact methods of urological diagnosis has reduced the number of purely exploratory operations upon the urinary tract to a minimum.

While a careful history and general physical examination remain of primary importance, it has to be recognized that many anomalous cases occur. Thus, "silent" renal calculi are not infrequently found and may destroy the kidney without attracting any attention to that organ or the general symptoms of chronic renal failure may mask those that would indicate gross changes in the upper or lower parts of the urinary tract. In many cases where the pathological processes are confined to the

¹ Read at a meeting of the South-Western Division of the Victorian Branch of the British Medical Association on March 7, 1925.

kidney, the symptoms are wholly vesical in character or the pain produced by a fixed calculus in one kidney may be referred to the opposite and healthy side. Again, the common complaint of pain in the side or back may be due to conditions in the kidney which only a complete urological investigation will reveal.

In the examination of the urine the most important pathological elements from the surgical standpoint are pus and blood, occurring singly or combined and often in very small amounts. Their presence or absence has frequently to be decided by the microscope and the diagnosis of pyuria, when associated with haemorrhage, depends upon the finding of leucocytes in excess of those to be accounted for by the amount of blood present. It should be noted, however, that there are many urinary disorders in which the urine remains normal.

The early determination of the origin of pus or blood is very necessary and exact diagnosis involves the tracing of each to its source and the finding of the underlying cause. In most cases this can only be done satisfactorily by the use of the cystoscope and ureteral catheter. Careful examination of the ureteric orifices and of the character of the efflux gives valuable information. The ureteric opening is a mirror of the renal pelvis and the localization of a haemorrhagic or purulent efflux to one side is often the major part of the diagnosis. Renal haemorrhage is characteristically intermittent and whenever possible the patient should be examined whilst bleeding is going on. The efflux of pus may vary from a very slight cloud which requires confirmation by the detection of pus cells in a ureteral catheter specimen to the slow protrusion of semi-solid purulent material.

The diagnosis of conditions in the bladder, such as growth, diverticulum and stone, is essentially cystoscopic. In view of the potential malignancy of all vesical tumours and of the ease with which small papillomata can be destroyed by endoscopic methods, their early recognition as the cause of a haematuria is especially important. Diverticula may be revealed as an unsuspected source of pyuria and may be the hiding-place of calculi which have given anomalous shadows on the X-ray film. Many bladder stones consist of a large proportion of uric acid and ammonium urate and therefore do not show a satisfactory shadow on X-ray examination. The relatively large number of vesical calculi which are not revealed by radiography, has been noted by several observers; whilst a shadow found in the vesical area may be due to a stone lying in the bladder or in a diverticulum or in the lower end of the ureter. Further, if the question of litholapaxy be considered, the free mobility of the stone and the presence or absence of other pathological conditions must be determined by cystoscopy before the operation is performed.

It is in the upper part of the urinary tract that methods of examination which involve the cooperation of the radiologist are of greatest value in diag-

nosis. A shadow found in a skiagram of the renal and ureteral areas frequently needs further investigation before an absolute opinion can be given regarding its significance; in other conditions of which hydronephrosis is an example, the data obtainable by the injection of solutions opaque to X-rays may often be the only ones on which an accurate diagnosis can be based.

Ureteral Calculi.

From the surgical point of view ureteral calculi are renal stones which have been arrested in their course along the ureter. A stone may be impacted either at one of the three points of anatomical narrowing or at the site of some pathological constriction of the tube. If it rests for a considerable length of time, the calculus grows mainly in an upward direction, the nucleus often being visible at the junction of the lower third with the upper two-thirds. The "date-stone" calculus is thus produced. Following the impaction of the stone secondary changes ultimately take place. Dilatation of the ureter occurs above and ulceration with secondary stricture formation may be caused at the point of arrest. The stone may then become freely movable within the dilated ureter and the migrant calculus change its position with that of the patient. In general the ureteral calculus is of greater immediate danger to the kidney than a renal stone, causing destruction of the corresponding organ by distension and by suppuration.

The clinical symptoms vary with the position of the stone. In the abdominal part of the ureter the pain produced resembles that of renal calculus, with approach to the bladder vesical symptoms appear and intramural stone causes typical vesical tenesmus. Haemorrhage is usually microscopic in amount, but an oxalate stone may give rise to a profuse haematuria resembling that from a malignant growth. Ureteral colic with haematuria may be produced by the passage of calculi too small to be detected in an X-ray film or by a shower of crystals in temporary or persistent oxaluria. Other conditions which may give similar symptoms and which give rise to an X-ray shadow, are calcified lymphatic glands and phleboliths; while errors may also arise from calcified deposits in pelvic organs or in tumours.

The shadow of a urinary calculus lies in the anatomical line of the ureter or in the position of the renal pelvis and calyces. Any of these structures may be displaced and when the ureter is much dilated, the shadow moves outwards towards the pelvic wall. Its outline is regular and its density uniform, though shading somewhat towards the margin. Exceptionally it may show a transparent centre and is then definitely due to a nucleated stone.

Calcified glands are generally abdominal or are found at the brim of the pelvis on the right side. They give rise to irregular shadows of varying density, producing a typical "mottled" appearance and

whether they occur singly or in groups, usually have a wide range of movement.

Phleboliths yield a sharply defined outline, are round or oval in shape and are not as dense as the majority of calculi. They commonly lie external to the line of the ureter; but one of a set of shadows may be due to stone, the remainder to phleboliths.

The cystoscopic appearances are generally characteristic when a calculus lies in or close to the intravesical portion of the ureter. The orifice is often gaping and its margins thick and congested, while there may be oedema of the surrounding mucous membrane. The efflux is sluggish and the stone may be seen projecting from the opening or forming a rounded prominence on the bladder wall. A catheter strikes the stone at once. These calculi may also be detected on rectal examination as hard, tender nodules on the corresponding side of the pelvis.

The exact diagnosis of other ureteral stones is made by the passage of an opaque catheter. This may be completely arrested and is seen in the X-ray film to be touching the shadow. It may appear to be curving round the shadow, a finding which is pathognomonic of stone, or it may pass with or without hindrance.

If the two shadows are in contact, the foreign body may be within the ureter or it may lie at a different antero-posterior level. Two exposures should then be made, either on one film with a six-centimetre shift of the X-ray tube (see Figure I.) or as stereoscopic views on separate films.

The diagnosis is completed by the injection of opaque fluid and the taking of a pyelogram and ureterogram. The condition of the urinary tract above the obstruction is thus shown and a shadow due to calculus is included in the outline of the filled and dilated ureter (see Figure II.).

Renal Calculi.

Stone in the kidney presents itself clinically as either a migratory or a fixed calculus. The former produces renal colic and haematuria, the blood being present in microscopic quantity in the majority of cases. It is typically a "*hématurie provoquée*," being definitely increased on movement and the urine being clear in the morning. With the fixed stone the symptoms are much milder and are easily overlooked. There may be no more than a dull aching in the loin or in the anterior renal area at the tip of the tenth rib. Infection generally occurs and the urine contains pus, but no blood. A pyonephrosis due to calculi may develop without other clinical evidence than a pyuria.

Most stones form in the lower calyx and first cause symptoms when they pass out into the lower angle of the pelvis. In its earliest stage the stone is round or oval and may not pass on into the ureter. By growth it moulds itself to the pelvic cavity and becomes wedge-shaped, with conical end downwards towards the ureter and two upward projections into the calyces. If uninfected the kidney remains small, though some distension of

the calyces may be going on. Finally, the "staghorn" calculus is produced and may form a cast of the whole pelvis and its branches. A large renal shadow with a single stone indicates that infection has occurred and then secondary calculi may develop in any of the dilated calyces. The degree of separation of their shadows gives an approximate estimate of the amount of dilatation present.

It is probable that all large renal stones, whatever their composition, throw shadows on an X-ray film which is of good quality. From their typical shape and from their position within the kidney outline a definite diagnosis is made. The small stones may cause confusion. Rarely a pure uric acid calculus lodges in the renal pelvis and is detected only when a pyelogram is taken, in which it appears as a clear area in the midst of the opaque fluid. The usual sources of error are calcified abdominal glands and gall-stones. The former represent the final stages of *tabes mesenterica* and can cause definite urinary symptoms, probably by drag or pressure on the ureter. Pain which may closely resemble renal colic, is more frequent than haematuria.

Upon cystoscopic examination there is little change at the ureteric orifice in the early stages of a stone which does not pass from the kidney. An increased and more frequent efflux as the result of irritation is the usual finding. If infection has taken place, there is a cloudy jet and often some injection and swelling of the margins of the opening. With a closed pyonephrosis the efflux is absent, but the orifice may show signs of inflammation and have a slow and feeble movement.

Pyelography is generally necessary for the diagnosis of small and atypical shadows in the renal area; by this means two other important facts are decided, the position of a calculus, whether in the pelvis, in one of the calyces or in the upper end of the ureter, and the amount of dilatation present and its distribution within the kidney. By the localization of the stone the operation may be planned so as to cause the smallest damage to kidney substance and the least danger to the patient. Nephrolithotomy should be avoided whenever possible. The functional value of the other kidney has to be estimated before operation in all cases but those in which a simple pyelotomy is indicated.

In a pyelogram the shadow of a renal calculus is obscured by or is continuous with that of the pelvis or one of the calyces; by tracing the outline of the simple radiogram upon the film which shows the opaque medium, the exact position of the stone within the cavities of the kidney is determined (see Figure III.). Occasionally the shadow of an opaque body which lies anterior to the kidney, will fall within the area of the renal pelvis and calyces and therefore is obscured by the fluid when these cavities are outlined. In these cases the pyelogram should be normal; to determine the exact relations stereoscopic films may be taken or lateral exposures made.

It is advisable for the radiographic examination to be carried out as short a time before operation

as possible; on account of the frequent occurrence of multiple stones widely distributed throughout the urinary system, the whole of the tract should always be included.

Hydronephrosis.

The only reliable symptom of early distension of the renal pelvis is pain; there are usually recurrent attacks of renal colic which resemble those due to stone or to severe pyelitis. In slow distension there is often merely a dull aching, intermittent or constant, in the kidney region, which may be attributed to chronic inflammation of the gall bladder or appendix. Right-sided pain, unrelieved by operation for each of these conditions, has not infrequently been shown to be due to a hydronephrosis. Lastly the condition may be entirely latent and a swelling in the loin may be the first evidence of a greatly damaged kidney.

A ureteral catheter can generally be passed directly to the kidney as the block is from above rather than from below. The amount of residual urine may then be measured and the capacity of the pelvis determined. On artificial distension the pain of the disease is reproduced and the patient recognizes it as such; but with a large sac the amount of discomfort may be very slight, even when the liquid is flowing back alongside the catheter into the bladder.

In a normal pyelogram with a well filled but not overdistended pelvis, the main cavity is typically cone-shaped with an uninterrupted shading into the ureter, though many variations in form may be observed, of which the bifurcated pelvis is perhaps the most frequent. Each calyx has a narrow neck and an expanded head, with indentation of the latter by the papillæ of the renal pyramid. The catheter should pass directly into the superior calyx, while at the lower border of the pelvis the curve from the ureter to the inferior calyx should be even and rounded (see Figure IV.).

With early hydronephrosis of pelvic type this curve becomes reduced to an angle, the outline of the pelvis is irregularly enlarged and the catheter is arrested by the upper wall of the cavity. With early intra-renal distension the calyces gradually assume a club-like form with rounded ends in which the pyramidal notch has disappeared, while their necks become shortened and thickened. The types become mixed in later stages, though either may still predominate. Thus the pelvis may form the larger part of the sac and a series of distended secondary pockets open from its lateral border (see Figure V.) or the greatly dilated calyces may be seen as large pouches grouped about a small central cavity (see Figure VI.). The ureter may be bound by adhesions to the surface of the dilated pelvis, its opening being carried upwards on the medial side of the mass.

In inflammatory conditions, chronic pyelitis and tuberculous disease, the outline of the pyelogram is typically indistinct or "fuzzy" (see Figure VII.). Some dilatation may be seen or the changes due to a pyonephrosis may be found, the lateral border

of the sac forming large bosses corresponding to the hollowing of the kidney substance. If the pelvis be notably dilated, medicinal or lavage treatment for the infective condition will probably be ineffective.

When mechanical obstruction is present, the cause is often discovered at the same time. Calculous hydronephrosis has been already illustrated. Deformities of the ureter from bands, adhesions or abnormal blood vessels, strictures of its wall or mobile kidney with kinking of the outlet may all be recognized, but there remains a proportion of cases in which no evident obstruction is found; retention within the renal pelvis is present. The ureter may be dilated or not and explanation has been sought in deficiency of the neuro-muscular control of the conducting tube. The condition may be bilateral and the state of the opposite side should be determined before nephrectomy is considered. Allied to these cases are those of general dilatation of the whole urinary system in children in which, owing to incompetence of the uretero-vesical valve, the great bilateral enlargement can be demonstrated by filling the ureters and pelvis with opaque fluid from the bladder.

When growth is present within the urinary tract, a filling defect may be seen with dilatation of the cavities above the obstruction, forming a partial or complete hydronephrosis. In tumour of the kidney substance at the upper pole deformity of the pelvis is generally produced and one or several calyces are obliterated. Similarly at the lower pole a renal growth or cyst may prevent the filling of the inferior calyces and cause a displacement of the ureter which is seen describing a large curve around the mass. With tumours of other organs the shadow of the renal pelvis is normal, though it may be displaced and on outlining the margin of the tumour by bismuth paste or wire laid upon the skin, the mass may be shown to lie quite apart from the kidney.

My thanks are due to the members of the surgical staff of St. Peter's Hospital, London, for the opportunity to investigate the cases upon which these remarks are based and I am indebted to Miss Maudsley, of the Walter and Eliza Hall Institute, for the preparation of the photographs needed for both the lantern slides and the illustrations.

THE URETER: A CLINICAL STUDY OF ITS COMMONER DISEASES.

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THE ureter is one of the most important conducting channels of the body, yet, save at the hand of the specialist, it has not received from the profession at large the attention it deserves.

The naso-pharynx, the œsophagus, the intestinal tract, the bile channels and so forth have all been

subjected to critical study and the advances of modern medicine thereon are familiar to all.

The ureter and its diseases have been studied no less, in fact urology is probably the most exact of the modern specialties.

This paper is presented with the humble belief that it will bring to the notice of the profession at large some of the commoner diseases of the ureter which owing to their obscure and peculiar symptomatology, are often undiagnosed and are a cause of much pain and disability.

It is most important to realize that the ureter is an abdominal channel with an identity its own, yet in close proximity to other important channels throughout its whole length, for example the bile passages above and the internal organs of generation below. It is not surprising therefore that, unless its pathology and symptomatology are clearly understood, confusion will occur with erroneous diagnosis and treatment. When we come to a consideration of the symptomatology of ureteric diseases, it will be seen how readily this confusion can occur. To take one example here, how frequently is the vermiform appendix removed for chronic intermittent right-sided pain under a mistaken diagnosis of chronic appendicitis? As I shall show in many of these cases the pain is really renal-ureteral in nature and, as every urologist knows, removing the appendix only relieves these patients for a very brief spell (probably owing to suggestion), often not at all.

Properly to understand this subject, it is necessary to take a brief survey of the anatomy and physiology of the ureter together with the pelvis of the kidney, for anatomically and embryologically they are one.

Anatomy of the Ureter.

The ureter begins above as a funnel shaped opening known as the pelvis of the kidney. In the sinus of the kidney this divides into two or three major calyces and each of these in turn divide into several minor calyces each of which embraces and collects the urine from one or two renal papillæ. There is considerable variation here, sometimes the pelvis is double, sometimes small and flat and hidden in the renal sinus. Most often it projects from the sinus, broad above and narrowing below to where it joins the ureter proper. Its capacity varies accordingly, an average being about five cubic centimetres.

The ureter proper is about twenty-eight to thirty centimetres long and, as seen in the living body, is a pale, slightly flattened cord. When empty a section of it shows it to be rugose and this indicates that it is capable of dilatation within certain limits. It is important to remember that its epithelial lining is continuous with the pelvis above and bladder below, so that it is impossible by an examination of the cellular débris of the urine to say from which of these areas it came. Errors have frequently arisen from not remembering this fact.

There are three important facts to remember with regard to its surgical anatomy. In the first place

the ureter is attached to the parietal peritoneum practically throughout its whole length. The mode of this attachment is peculiar and, as far as I know, has not been so described elsewhere. The ureter is somewhat loosely attached to the peritoneum by areolar tissue, but the special feature of it is that scattered throughout this areolar tissue there are small bands or vincula of very fine but very tough fibrous tissue. They serve to bind the ureter to the peritoneum. It requires considerable force to break them with a forceps. Where a vessel, for example the spermatic or ovarian vessel, crosses the ureter, they also are bound down to the peritoneum by one of these bands. I have repeatedly at operations on the ureters and in the *post mortem* room demonstrated these bands to my house men and my students. Their importance lies in the fact that they are one of the commonest causes of kinks in the ureter to be described later. It is also important to remember that the ureter, being bound to the peritoneum, is brushed aside with it, for I have seen surgeons waste much time looking for the ureter through forgetting this fact.

Secondly the kidney lies in a mass of canary yellow fat (the perirenal fat). This fat together with the kidney is enveloped in a somewhat tough fibrous capsule, a modification of the *fascia transversalis* known as Zuckerkandl's fascia. This ends in a free edge at a variable distance below the point where the pelvis joins the ureter proper. The importance of this can be seen from the following. The kidney and that portion of the ureter within this fascia have a wide range of movement, but below this the ureter is firmly attached, as previously stated, to the peritoneum. Therefore any disparity in the relationship of these attached and unattached portions of the ureter, for example excessive mobility of the kidney, can easily set up a kink in the ureter at the attached portion or at the nearest firm band that I have described above. This is a second cause of kinking of the ureter.

The third fact to remember in the anatomy of the ureter is that this duct is not of the same bore throughout its length. There are anatomical constrictions in it due to a relatively greater mass of circular muscle fibres at these points. The more important of these narrowings occur at the neck of the major calyces, where the pelvis joins the ureter, where the ureter crosses the brim of the pelvis (that is at the external iliac vessels), in the broad ligament and in the wall of the bladder.

The importance of remembering these anatomical constrictions lies in the fact that in interpreting pyelo-ureterograms, they must not be mistaken for organic strictures of the ureter.

The ureter derives its blood supply from a number of vessels throughout its course and it would be tedious to go into that matter here. It is important to remember that these vessels form a very free anastomosis in the outer coat of the ureter and again in the submucosa after penetrating its wall. So free is the anastomosis throughout the whole length of the ureter that it is possible to inject the whole system through any one of its branches.

This allows the surgeon a very free hand in detaching the ureter for a considerable length from its supports. I have had to do this in the abdominal portion of the ureter on several occasions without any untoward result, but gynaecological surgeons know that in the Wertheim operation for hysterectomy the separation of the ureter from its supports where it crosses the broad ligament often leads to necrosis of its wall with the formation of ureteric fistula.

The wall of the ureter is richly supplied with lymphatics which are in communication with those of the bladder below and of the kidney above.

I mention this fact because it is still much debated as to how the infection spreads from the bladder to the kidney in some cases of cystitis, whether by way of the ureteral lymphatics or along the mucosa.

A patient under my care died from double septic pyelonephritis. He had been operated on for hernia and, having a stricture of the urethra unknown to us, considerable difficulty was experienced by the house surgeon in relieving his post-operative retention. Unfortunately, his bladder became infected and later his kidneys. Macroscopical and microscopical section of the ureters showed perfectly healthy mucosa, but an intense lymphangitis, the lymphatics being full of organisms.

Physiology of the Ureter.

The ureter like many of the other hollow muscular tubes of the body undergoes peristaltic contraction. The peristaltic wave starts at the pelvis and travels at the rate of twenty to thirty centimetres a second to the ureteral orifice in the bladder. If watched carefully, a fusiform dilatation about four millimetres long is noted and just behind this the ureter is noticed to be contracted. The wave passes quickly along. In some patients it is frequently repeated, in others it seems to occur only at fairly long intervals. The mechanism of this peristalsis lies within the ureter itself as it is observed in a piece of ureter removed from the body and kept in warm saline solution. Under some circumstances it may be reversed.

When the ureter is exposed through the lumbar incision, it is a fascinating study to watch the peristaltic waves passing along it. I have frequently demonstrated them to others. They seem to pass very quickly. It is an interesting point for discussion as to how the urine passes down the ureter.

Gravity may play some part in it, because during cystoscopic examination if the ureteric orifice is watched carefully, now and again a drop of urine will be noticed to trickle out of the orifice without any apparent peristaltic wave being responsible and *per contra* I have frequently watched a peristaltic wave reach the ureteral orifice in the bladder without any jet of urine escaping.

The point is that the waves are continuous and are independent of the presence of urine in the ureter, but that most probably the great bulk of the urine is passed from the kidney to the bladder

by them. I might add here that the appearances of the ureteric orifice in the bladder have a great range of variation and experience alone can make one familiar with them. Also a variable portion of the intramural portion of the ureter can be seen to raise the mucosa into a ridge. When the peristaltic wave reaches the bladder wall it can be seen with the cystoscope to pass rapidly along this submucous portion; the orifice gapes open and the jet is expelled with some force. The presence of a foreign body sufficiently large to set up tension in the wall of the ureter produces violent colicky pain.

The ureter is endowed with sensation, a patient can feel a catheter passing up it. Usually they make no complaint, but occasionally they remark on it and can localize it fairly accurately as it ascends. I do not know whether others have noted this latter point. The probable explanation is that the catheter acts as a foreign body and causes stimulation of the ureteric muscle sufficiently strong to be felt as a sensation.

Symptomatology of Ureteric Diseases.

Diseases of the ureter are so frequently set up or are associated with pathological disturbances in the kidney and bladder that under this heading one cannot escape from a general description of urological symptomatology. Much confusion is abroad about the nature of so-called renal colic. The classical description of pain starting in the costovertebral angle and passing along the course of the ureter to the bladder and so forth is really a combined renal and ureteric colic.

I am convinced that true renal colic is largely if not wholly a phenomenon due to blocking of the pelvic outlet and an accumulation of urine in the pelvis under tension. Much direct experimental evidence on the human subject is available to support this contention. When a catheter is passed up the ureter and its tip is lying free in the pelvis of the kidney if fluid is slowly injected, after a time which varies with the capacity of the pelvis, pain is caused. If the tension is increased, this pain is increased and very soon, unless one is cautious, reaches great severity. In the great majority of cases the patient complains of the pain behind in the costo-vertebral angle passing through to the subcostal region in front. I have observed this phenomenon many times in the last six years while taking pyelograms, but I cannot recall to mind ever seeing a case in which the pain passed down the ureter to the bladder and so forth as it does in supposed "renal colic." My contention is that the phenomenon so observed is a pure renal colic and that the "classical" description is combined reno-ureteral colic.

Further evidence on this point is derived from the clinical observation that those small stones that actually get into the ureter and can be located there with the X-rays, their progress watched and their subsequent discharge verified, set up intense pain along the course of the ureter shooting into the bladder, penis, vulva, testicle or down the thigh. This is true ureteric colic. The passage of

blood clots and tuberculous *débris* gives the same train of symptoms. In further support of my contention that the renal portion of the pain is a pelvic distension phenomenon, we have the clinical observation that large fixed stones, too big to be discharged through the ureter, often cause no symptoms or else only an ache in the loin behind, the presumption being in these cases that the urine can pass by the stone into the ureter, the opening never having been blocked.

It has been the experience of every surgeon sooner or later to find a patient in whom a stone can be detected by X-ray in the kidney and of which the patient was quite unconscious. Similarly a slowly produced block of the ureter will set up hydronephrosis without much pain, but an acute obstruction will set up intense pain.

Everyone is familiar with so-called renal colic, but the variations of it are not so well known. It is most important that they should be, because without this knowledge the diagnosis of some forms of abdominal pain is impossible.

True renal colic, as I have said, is generally felt in the costo-vertebral angle behind, passing through the loin to the sub-costal region in front. Sometimes the patient feels pain behind only and more rarely only in front. In this case it would be almost impossible without the cystoscope to tell it from gall stone colic. I know of one patient whom I saw during an attack of colic on several occasions when it was impossible to tell whether she had a biliary or kidney colic. Her subsequent history was interesting inasmuch as she had a healthy (*sic*) gall bladder removed by another surgeon; at the operation her common duct suffered injury from which she subsequently died. Urological methods would probably have shown the lesion to be in the kidney or ureter.

Another fundamental variation in the form of true renal colic is as follows. Instead of feeling the pain from the costo-vertebral angle behind to the sub-costal region in front, the patient feels the pain from the iliac fossa through to the sacro-iliac joint. I have seen this type of pain in a number of cases of kinks or strictures in the ureter and have demonstrated this extraordinary anomaly to my colleagues. At the meeting of the Sydney Hospital Clinical Society held on March 5, 1925, I showed a pyelo-ureterogram of a patient which demonstrated moderate dilatation of the pelvis and calyces with kinking of the ureter about 2.5 centimetres (one inch) below the uretero-pelvic junction (see Figure II.). For two years this patient had complained of pain in the left iliac fossa passing through to the sacro-iliac joint and on rare occasions had slight pain in the back. On distending the renal pelvis (during the taking of a pyelo-ureterogram) I reproduced her pain in the left iliac fossa and sacro-iliac joint exactly and also slightly in the back. At operation there was a definite kink in the ureter where it leaves the peritoneum to enter the perirenal fat and join the pelvis of the kidney. The band was divided and the kidney fixed by a simple process. The relief was immediate and has been maintained.

Now I have seen the same phenomenon on the right side and in a number of these patients the appendix had been removed under a mistaken diagnosis of chronic appendicitis without relief. To recapitulate then, certain types of renal distension pain, whether produced by kinking or stricture of the ureter, produce a syndrome that in one instance simulates gall bladder colic very closely and in another is often diagnosed as chronic appendicitis or even as disease of the pelvic organs.

So far, I have described the colics of renal and ureteric origin or combined, but it is not so generally known that in diseases of the ureter a feeling of localized soreness and tenderness may occur without colic. This may occur in cases of ureteritis, to be described later. It is obvious that it may lead to an erroneous diagnosis of appendicitis or inflammation of the pelvic organs in male or female. Quite the most remarkable example of this that could fall to the lot of any urological surgeon came my way in December, 1924.

A patient presented himself at my outdoor clinic complaining of pain in the right side of about four years' duration. This pain (he indicated the right iliac fossa) was more or less constant, but at infrequent intervals was more severe and of the nature of ureteric colic. Physical examination revealed tenderness in the right iliac fossa. *Per rectum* the lower portion of the right ureter was felt to be thickened, hard and tender. The urine was quite clear, otherwise physical examination revealed nothing. An X-ray examination disclosed "a stone in the right ureter probably at the uretero-vesical junction."

With the intention of removing this through the operating cystoscope, I had him admitted to one of my beds. Cystoscopy revealed a peculiar picture. The ureter orifice on the right side was gaping with thickened lips. There was no stone present. The shadow in the skiagram was due to an area of calcification in the wall of a greatly thickened ureter. The bladder was quite healthy, except that around the diseased right ureteric orifice attached to an apparently quite healthy bladder mucosa, there were some half dozen milky-white bodies that looked like tiny pearls. I suspected these of being small tuberculomata. The largest of these was removed with a rongeur through the cystoscope. With much care and patience my esteemed friend, Dr. Keith Inglis, cut me a section of this minute piece of tissue. The section showed a mass of fibrous tissue and embedded in it were the ova of bilharzia. This patient left hospital at his own request as it was Christmas time. He was to have reported in January, but unfortunately cannot now be traced.

I mention this out-of-the-way case because it must be remembered the patient had no bladder symptoms. His only complaint was "pain in the side" and the X-ray picture would lead one to an almost certain diagnosis of stone in the lower end of the ureter.

It is impossible in this paper to cover the whole field of urologic symptomatology, but there are certain aberrant symptoms not so well known and lack of appreciation of them may lead to disastrous consequences. Take for example the question of referred symptoms. It is well known that in early unilateral renal tuberculosis the only signs may be pus in the urine and frequency of micturition. This may lead to an erroneous diagnosis of cystitis. In some cases of this type there is also an ache in the healthy kidney of the opposite side to add still further to the confusion.

Renal colic may be referred in two ways. Coincident with the attack of colic there can be felt a more or less severe ache on the opposite side or severe pain on the opposite side may alternate with colic on the affected side. I have personal experience of a case of this kind in a man, aged fifty, extending over a period of six years.

I first saw the patient in what appeared to be a typical attack of gall bladder colic. A friend of mine, a surgeon of no mean order, agreed with this diagnosis. He then had a succession of severe attacks of left reno-ureteric colic. Later the pain shifted to the right side when he had many attacks of right reno-ureteral colic. X-ray examination was always inconclusive owing to his extreme corpulence. Eventually a small stone was removed from the pelvis of the right kidney. The gall bladder was inspected at the same time and found healthy.

It is well known that a growth of the bladder, such as a papilloma producing severe haematuria, will also produce severe renal aching on one or other side, possibly due to partial obstruction of the ureteric orifice. It is more difficult to explain renal aching in infection confined to the bladder. I do not know whether other urologists have observed this, but it is an undeniable fact. Some years ago I saw a remarkable case of this kind.

A young man had been under the care of a physician for several months with definite symptoms of cystitis, that is painful frequency of micturition, urgency and much pus in the urine. His temperature had been raised all this time and there was constant aching in the left kidney region. He looked very ill. A surgeon of repute saw him and on clinical grounds diagnosed "ulcero-cavernous tuberculosis of left kidney." Tubercle bacilli had not been found in the urine despite frequent examinations. When he came under my care I elicited the fact that about six months before he had had gonorrhoea which had received very inadequate treatment. His prostate was not enlarged and the prostatic fluid contained only a few pus cells. The cystoscope was introduced with difficulty owing to gonorrhoeal infiltration of the urethra, in other words a soft stricture. This was dilated with sounds and the cystoscopic examination made. The bladder wall was inflamed, but the urine as it escaped from the ureteric orifices was quite clear. I was greatly surprised to notice this, because I fully expected in view of the persistent aching at the left side to find the kidney infected. His bladder was washed out with permanganate of potash. In twenty-four hours his temperature was normal and did not rise again. With frequent bladder irrigations of permanganate of potash and another dilatation of the urethra, he was discharged from hospital in a fortnight free of all symptoms, with clear urine and his renal aching gone.

Since that time I have met the same phenomenon on a number of occasions, that is pain in the kidney region when the infection was confined to the bladder. I have noticed it both in males and females and on both the right and left sides. Unless this fact is known, disastrous errors in diagnosis are likely to occur, as is seen in the following case.

Some time ago I was asked to examine with the cystoscope a female patient whose condition was diagnosed as right renal tuberculosis. She had symptoms of cystitis of some months' duration, purulent urine, frequent and painful micturition and persistent aching in the right loin. Tubercle bacilli could not be found in the urine. Cystoscopic examination revealed patches of granular cystitis, but the ureteric orifices were healthy and the urinary jet from each was perfectly clear. Despite my objection the surgeon persisted in his diagnosis and removed a healthy kidney on the right side.

Of course, in many cases symptoms of cystitis with renal pain or colic on one or other side mean

that the kidney on that side is infected, but it is important, as I have shown, to realize that this is not necessarily so and unless care is taken to prove this with the cystoscope, grave errors will be made.

Diseases of the Ureter.

Space could not possibly permit anything like an adequate description of the diseases of the ureter and it would serve no useful purpose were I to attempt it.

I propose to confine my remarks to clinical observation on some of the commoner diseases met with in general and urologic practice.

Ureteritis.

Whether primary ureteritis occurs or not is somewhat debatable. On theoretical grounds in view of its length, its rich blood and lymphatic supply, there is no reason why organisms circulating in the blood from some other septic focus, such as teeth or tonsils, should not be deposited in the ureteral wall just as they are in the bones and joints and kidneys.

When we come to the question of stricture of the ureter we shall see that it is highly probable that some of these strictures are the result of contraction following on the healing of localized patches of primary ureteritis. I would rather confine my remarks here to a form of secondary ureteritis; a ureteritis secondary to or associated with pyelitis or cystitis or both.

Acute pyelitis, so called, is a common disease and needs no description here. All practitioners are familiar with it and with its variations from a mild disease to one of fulminating severity. The great bulk of these patients get better with appropriate treatment, such as rest, suitable diet, the administration of alkalis and so forth. In many of the cases the organisms are blood borne and deposited in the kidney; in other cases the infection ascends to the kidney from a cystitis below and a common type is associated with pregnancy. What is not generally known is that in a certain proportion of these cases there is an associated ureteritis, the condition then becoming one of pyelo-ureteritis and often there is tenderness to palpation along the course of the ureter.

The outstanding clinical fact is that a certain proportion of patients suffering from acute pyelitis verge into the chronic state and become the despair of everyone. The treatment of these individuals is fraught with many difficulties. I am greatly disappointed in vaccine therapy and have rarely seen it do any good. From my observations of a large number of these cases in the last six years, I am convinced that the chronicity in many of the conditions is due to an associated ureteritis.

Ureteritis produces narrowing of the ureter, really a condition of soft stricture due to cellular infiltration of the ureteral wall analogous to the gonorrhoeal "soft infiltration" of the urethra, so aptly named by Oberlander.

If such be true, then the chronicity of these cases of pyelitis immediately falls into line with many other surgical conditions in which chronic

infection is kept up through faulty drainage. Many urologists now treat these patients by irrigation of the renal pelvis through a ureteric catheter introduced by the cystoscope and the results obtained are far above any treatment devised hitherto. Several able physicians with whom I have discussed this matter, frankly admit that these cases of "chronic pyelitis" should be dealt with by urological means. Washing out the renal pelvis with various chemical agents, such as silver nitrate, "Argyrol," colloidal silver and so forth, is supposed to have a curative effect. I have often strongly suspected that the chemicals had very little to do with the treatment, but that rather the great bulk of the benefit derived was due to dilating an associated soft stricture of the ureter due to ureteritis and thus establishing good drainage from the kidney.

It was with this end in view that I investigated a series of cases of chronic pyelitis. The procedure was to take a ureterogram first in order to demonstrate any narrowing of the ureter; then the ureter was dilated with a graduated series of catheters and the pelvis washed out with normal saline solution only. In most of the cases I could demonstrate the stricture of the ureter and in all of them the improvement was remarkable. I do not now irrigate the pelvis with solutions of silver nitrate *et cetera* as recommended by some urologists. The reaction is often too severe. I am satisfied that dilating the ureter is the fundamental part of the treatment, not chemical irrigation. I can recall to mind two cases in particular that strikingly illustrate this contention.

The first was a young man referred to me by a colleague (a physician). The patient had an acute attack of pyelitis. By the end of nine weeks of medical treatment he was not cured, but much improved. There was still pus in the urine with *Bacillus coli communis* organisms; his evening temperature was slightly raised, he had aching in the right loin, attacks of bladder irritation (reflex) and occasional headaches, with a dirty tongue. I dilated his ureter with a number VI. ureteral catheter and washed the pelvis of the kidney with very diluted permanganate of potash solution. I fully expected to have to repeat this dilatation for a few times at weekly intervals. This was never needed. From the first dilatation his improvement began, until at the end of a week no traces of his old complaint remained. I frankly admit that I was as surprised as anyone at the rapidity of the cure.

The other case was that of an elderly lady referred by a surgical colleague. She was known to have had pyelitis and bacilluria for many years; she apparently had been content to put up with this until recently she began to get severe left renal colic. She was referred to me, as her surgeon suspected a stone in the left renal tract. X-ray examination revealed no stone. I dilated her left ureter with a Garceau catheter through the operating cystoscope. Her improvement was rapid. The treatment was repeated one week later and from then all her symptoms disappeared. The urine became clear and at present, four months after her discharge from hospital, she is quite well.

Stricture of the Ureter.

The question of stricture of the ureter is a wide one, but strictures are more common than has hitherto been supposed. Common causes of simple stricture are a previous attack of pyelo-ureteritis: the healing of ulceration produced by a ureteric

stone; secondary ureteritis due to pelvic cellulitis in the female. All these conditions are apt to produce stricture of the ureter with the characteristic symptoms of renal distension and possibly infection. They are treated by dilatation of the stricture with bougies introduced through the cystoscope. The more serious condition of tuberculous stricture is beyond the scope of this paper, because it rightly belongs to the vast subject of genito-urinary tuberculosis.

Kinks in the Ureter.

It has surely been the experience of every medical man to meet with patients who complain of renal colic and in whom there is no evidence of stone or infection in the renal tracts.

The urological surgeon certainly sees a large number of such patients and many of them tax his resources to the utmost to determine just what the cause of the pain is. After eliminating those obscure cases of soft stone which are not disclosed by the X-rays, ureteric strictures and other rare conditions, there are not a few due to kinking of the ureter brought about in a manner that I have not seen described elsewhere. I personally have had a considerable number in recent years. In investigating cases of this sort the fundamental thing to do is to determine whether the pain complained of is really a renal pain or not.

At first sight this would seem a gratuitous statement, but it must be remembered that these patients do not always complain of reno-ureteral colic, but of a pain due to distension of the renal pelvis which takes a variety of forms as I have described in detail under the heading of symptomatology.

The late John B. Murphy pointed out that a pain of this sort can be very readily identified by reproducing it. This is done by passing a ureteral catheter on the suspected side and distending the pelvis and ureter until pain is reproduced. Even in patients of only moderate intelligence pain of this kind is immediately recognized and identified. The distending medium I use, is either sodium bromide or iodide in 25% solution. This is impervious to X-rays. When the kidney and ureter are at the optimum state of tension a picture is taken which gives a clear cut outline of the calyces, pelvis and ureter, the uretero-pyelogram. Familiarity with this procedure enables the operator to deduce many things. He can identify the pain complained of from a number of similar pains, such as gall bladder pain, chronic appendiceal pain, referred pain from the pelvic organs or *spondylitis deformans* and so forth. He can determine any abnormality of the outline of the calyces, pelvis or ureter produced by bands, strictures, aberrant vessels, growths *et cetera*.

Working along these lines I have found that a not uncommon condition is kinking of the ureter at about that position where it leaves its attachment to the peritoneum to enter the perirenal fat. I have already described this in detail. With a good pyelogram showing an evident kink of the ureter or a fusiform dilatation of the ureter beginning above

ILLUSTRATIONS TO DR. J. T. TAIT'S ARTICLE.

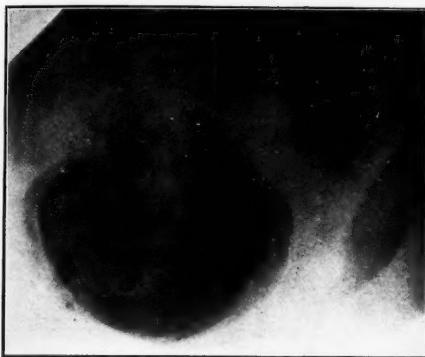


FIGURE I.
Stone in Pelvic Portion of Ureter; Catheter
Passing the Shadow on Two Exposures.



FIGURE II.
Dilatation of Ureter Above Stone.



FIGURE III.
Two Renal Calculi; Pyelogram and
Superimposed Film.



FIGURE IV.
Normal Pyelogram.



FIGURE V.
Hydronephrosis of Pelvic Type.



FIGURE VI.
Hydronephrosis of Renal Type.



FIGURE VII.
Chronic Pyelitis.

ILLUSTRATIONS TO DR. REGINALD BRIDGE'S ARTICLE.



FIGURE I.
Showing a Kink at the Junction of the
Pelvis and Ureter.

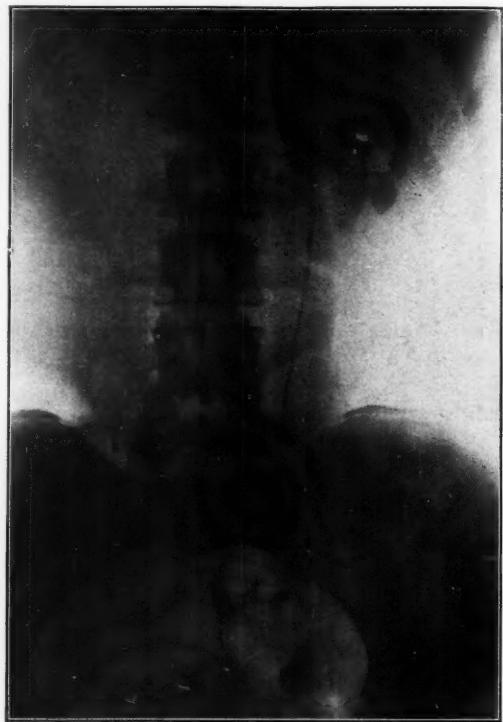


FIGURE III.
Large Hydronephrosis and Hydro-ureter due to Stone the
Size of Pigeon's Egg in Pelvic Position of Ureter.



FIGURE II.
Kink in Ureter where it leaves Perirenal Fat to
become Attached to Parietal Peritoneum.



FIGURE IV.
Kink in the Ureter just below its Junction
with the Kidney Pelvis.

an obvious constriction, one can learn to recognize the cause of the kinking and deal with it by operation. The grosser forms of ureteral kinking due to an aberrant renal artery have been described by the Mayo brothers. An interesting cause is an aberrant renal artery which runs directly to the lower pole of the kidney with the ureter crossing in front of it instead of behind as it should do. The result is that the ureter becomes "bow strung" across this vessel with hydronephrosis resulting. The remarkable thing about this condition is that though it is obviously congenital, these patients do not usually develop symptoms until adult life.

Some years ago I removed a large hydronephrotic kidney from a girl of eighteen who had only complained of symptoms for about twelve months. Her kidney was reduced to a mere shell of fibrous tissue. The ureter had become kinked across an aberrant renal artery. I believe the specimen is in the museum at the University.

Another cause of kinking of the ureter has relation to the ovarian or spermatic veins. These vessels pass up on the outer side of the ureter and at a variable distance below the pelvis of the kidney cross the ureter to join the *vena cava* on the right side, the renal vein on the left. As they cross the ureter I have noticed a firm little fibrous band at this point binding the vessel to the ureter and both to the peritoneum. As long as the alignment of the ureter is maintained, no kinking will occur. But any increase of the mobility of the kidney or any physical alteration of the position of the ureter below, such as increasing adiposity or visceroptosis and so forth, is apt to set up a kink in the ureter. Partial intermittent blockage is set up with intermittent pelvic distension pain in consequence. These patients are often branded as neurotics and I regret to say that I too have fallen into that trap.

I operated on a young nurse for this cause.

She ascribed her trouble to lifting a heavy patient. In her case the kink in the ureter was due to a small fibrous band at the spot where the ovarian vein crossed it. She had had her appendix removed under a mistaken diagnosis. In her case the sudden strain of lifting the patient apparently stretched the kidney supports allowing a moderate descent of the kidney, the ureter being firmly attached by a little band where the ovarian vein crossed it, became kinked and partial intermittent obstruction resulted. She was well two years after operation.

Space hardly permits any further discussion of ureteric diseases, such as ureteric stone, nor of operative technique. It will suffice if I have shown that pathological conditions of the ureter cause many of the obscure abdominal symptoms that medical men are called on to treat.

THE PSYCHO-NEUROSES OF SOLDIERS AND THEIR TREATMENT.

By PAUL G. DANE, M.D. (Melbourne),
Neurologist, Caulfield Repatriation Hospital.

It is now six years since the war ended and the problem of the genesis and treatment of the psycho-neurotic soldier is still one that remains to be

solved; there is no doubt that the pathogenesis and growth of any psycho-neurosis presents a problem that is extremely complex and in the case of the soldier the whole condition is made more complex by certain factors which are not always so apparently operative in these distressing conditions as seen in civil life. One of the most important of these contributing factors is of course the economic gain by the flight into illness.

There are two things especially to be learned by the observation of the neurotic soldier; one being that wrong treatment (and most of the treatment given to these patients has been wrong either in regard to its quality or its long continuance in one or more forms) is actually worse than no treatment and the other is that in the vast majority of cases time does not work a cure, contrary to the soothing advice so often wisely given by medical practitioners.

These psycho-neurotic patients are still presenting themselves for treatment in a steady stream.

The above considerations alone are sufficient excuse for presenting some observations on these distressing and highly interesting conditions based as they are on a close and intimate study of some hundred odd cases. But further excuse is easily found in the fact that anything which will enlarge our knowledge of the pathogenesis and treatment of these mental states and stimulate thought and discussion may lead to a lessening of the economic burden entailed on the community and a mitigation of the awful suffering that these unfortunate members of our army are still undergoing.

Classification of Neuroses.

It is necessary for descriptive purposes to adopt some method of classification, but it must be clearly understood that in very few cases are the signs and symptoms so well defined as to enable a definite clinical label to be attached. In civil cases this difficulty is also encountered, but not to the same degree. Cases of pure hysteria or pure compulsion neurosis are met with in ordinary practice, but in practically every instance of war neurosis there is a large amount of definite anxiety complicating the other symptoms.

I have therefore endeavoured for the purpose of this paper to make a rough classification into:

- (i.) Anxiety states;
- (ii.) compulsion neurosis;
- (iii.) conversion hysteria;
- (iv.) neurasthenoid condition;
- (v.) organic conditions with which are associated a psycho-neurotic disturbance.

Anxiety States.

The symptoms in anxiety states rank from ordinary nervousness up to a condition of almost complete helplessness, from excessive anxiety and strong phobias.

Some of these men are in such a state of anxious tension that they can barely face contact with or hold communication with another person. Others have their lives made miserable by fears of all sorts, chiefly of noises, trains, traffic, knives and fears of insanity. These conditions roughly correspond to

anxiety hysteria as defined by men such as Freud, Jones, Brown and others. Anxiety neurosis as a pure state is practically never seen; compared with civil practice it is very rare.

Compulsion Neurosis.

Compulsion neurosis with anxiety states constitutes the condition from which the main bulk of the patients suffer.

In this condition there is also more or less anxiety, but the main symptom consists in one or more compulsions generally to commit suicide or kill a near relative or relatives.

The compulsions are never so varied or bizarre as those found in similar cases in civil practice, but are more stereotyped. They have nearly always been towards suicide or homicide, but the ultimate effect is the same as in civil cases, there being an almost total incapacity for work due to the enormous amount of psychic energy taken up in fighting the compulsion.

Anxiety may be present in a mild or in an excessive degree and overshadow the compulsion, but the latter is spoken of sooner or later during treatment when the patient has become confident in the medical man.

Conversion Hysteria.

In conversion hysteria, which is a well known state, there is some definite physical sign or signs such as paresis, contracture, bodily pain, fits and so forth, accompanied, however, in these war cases, generally, by more or less definite anxiety.

Neurasthenoid Conditions.

I use the adjective neurasthenoid rather than the noun neurasthenia for the reason that it does not connote any definite condition or disease *sui genesis*, but rather an ill-defined group characterized by weakness, bodily pains, anorexia, constipation and anxiety in a lesser degree than in the anxiety states.

Organic Disease and Psycho-Neurotic Disturbance.

In the class of organic disease are placed patients who manifest one or more of those signs known to be diagnostic of organic disease of the central nervous system or who give the "general impression" of incipient organic disease together with associated psycho-neurotic symptoms.

Among these diseases there may be mentioned mental defectiveness, *dementia praecox*, disseminated sclerosis, epilepsy, locomotor ataxia, encephalitis and gun-shot wound of the head.

Pathogenesis.

There is probably no more difficult problem in the whole range of clinical medicine than to discover the origin and trace the growth of a psycho-neurotic symptom or condition.

We are here at once confronted with the mystery of the relationship of mind and matter (although, I am aware that some purport to find no mystery or difficulty in solving this relationship) and also the organic bases of instincts and emotions.

It is not the purpose of this article to touch upon these problems, but it can be definitely stated

that so far no purely material explanation of such a psychic process as a dream or a compulsion or a phobia is forthcoming nor does it appear likely that such will be produced. And so without denying the material bases of mental phenomena we are compelled to investigate the psychological bases of these phenomena and seek there in the broad world of experience for clues or facts which will lead to an understanding and cure. The psycho-neurotic patient has been and still is treated by drugs, gland tabloids, massage, baths, trips to the country and so forth without any result except perhaps bad ones such as the fixation of the symptoms and the enrichment of the quack.

It ought now to be plain to all medical men that psycho-neurotic conditions cannot be successfully treated by these materialistic means, for some of these states disappear without treatment and others persist in spite of all treatment.

There is, however, now, thanks to the labours of such men as Charcot, Janet, Freud, Putnam and others, a clearer understanding of medical psychology and a considerable body of clinical evidence that these emotional disorders can be understood and cured.

The basic factor on which the modern conception of the psycho-neurosis rests, is that of the "unconscious mind" with resulting mental conflict and disharmony between this functioning of the mind and the newer and higher functioning of consciousness, the two terms of mental life being used purely in a descriptive fashion.

From this basis the conception of other mental mechanisms such as repression, conversion and so forth has been evolved. There is at present no possibility of understanding a psycho-neurotic condition except through a very earnest study of modern psychological theories and further a very close study of the psycho-neurotic individual. One may have a most intimate knowledge of the anatomy of the brain and cord with its layers and ganglia and association fibres and tracks without being in any way helped towards an understanding of the problem of a dream, a phobia, a conversion symptom or a compulsion.

But above all the medical practitioner must be brought into intimate personal contact over a considerable period of time with each neurotic patient before he can realize the terrible suffering and incapacity which in many cases are the result of these conditions. It is this contact further which alone develops a sympathy for these patients without which one can hardly undertake a cure. The question always arises in one's mind: Is there any one definite underlying basis for the many different psycho-neurotic manifestations? Freud and his followers assert that there is and that all psycho-neurotic manifestations have as their common root a disturbance in the psycho-sexual life. Adler and his followers assert that the root disturbance is an organic inferiority which the individual realizes and attempts to compensate for by the striving for mastery through the symptoms.

Jung has evolved a system somewhat akin to the Freudian concept but without allowing the sexual life the premier position in the symptom formation, the disturbance as he believes being due rather to the ego and its life's purpose.

Many British psychologists while accepting some part of the Freudian mechanism consider that the position is more simple that the symptoms at any rate of the war neurosis are due to disturbances of the instinct of fear.

I must confess that to me the problems of the psycho-neurosis can be understood only on the lines laid down by Freud.

In civil cases by proper psycho-analysis it can always be shown that sooner or later during the course of analysis a definite disturbance in the sexual life is disclosed, nor is this to be wondered at seeing that practically no one leads even superficially a normal sexual life. This is further exemplified in a study of the psycho-neurotic soldier for in many cases one can even by superficial analysis or an ordinary anamnesis discover very striking aberrations in the sexual life, such as decrease in the sexual desire up to abhorrence of the opposite sex, all degrees of impotence, masturbation and dreams which are manifestly of a sexual nature. It is not possible to question all patients, some resent it, nor is it possible to analyse every condition, but if one does take the trouble to do either or both of these things, one will be surprised at the frequency with which the patient will tell of abnormal sexuality.

Space does not permit an extensive discussion of the psycho-sexual aspect of war neuroses, but investigation discloses that they are built upon the typical Freudian concepts and the homosexual and narcissistic components appear to be the ones most generally disturbed.

I have not been able to demonstrate the mechanisms of Adler and Jung nor is it indeed easy to follow either of these writers in the translations of their works which I have read.

The ideas of many British psychologists are quite too simple to explain the symptom formation, the instinct of fear with its repression could not and does not explain the long continuance of these states. Many of these patients knew no fear and in those in whom a cure is brought about by the recovery of a war amnesia and accompanying abreaction, there still remains a residuum of symptoms, which although perhaps mild still require further elucidation. If the analysis is then continued (it may not always be desirable to do this) one meets with great resistance and gradually a psycho-sexual factor, in which there can nearly always be clearly traced a disturbance of a narcissistic or homosexual nature, is observed.

The history of many of these patients before, during and since the war and the history of the psychic trauma which precipitated the conditions, clearly show narcissistic and homosexual trends. Some are boastful, egotistical and complain of symptoms in almost every region of the body, others

have been solitary, somewhat asocial wanderers. In others again the psychic trauma was such as the death or mutilation of a loved comrade more than an actual trauma to themselves or the psychic situation may have been such as to lead to conduct, the nature of which they are unwilling or ashamed to recognize as their own actions. Others again are men who in spite of great sexual temptation whilst in the army have undergone complete denial and, lastly, there are some who witnessed homosexuality or who in some way or other were brought into association with either alleged or actual homosexual situations whilst on service.

These facts together with the results of psycho-analysis on those suitable for such treatment lead one to believe that there is no difference in the psychic basis or psychic mechanisms involved in the neuroses of peace and war.

This position is a tentative one and is always open to review if further investigation or criticism can show any errors.

Analysis of Cases.

It is not necessary to publish the individual case histories but the following tables indicate the physical and mental status, treatment, results and so forth. Under the heading of treatment analysis includes all cases in which a war amnesia existed and in which an attempt at recovery was made as well as those cases in which a thorough psycho-analysis was made.

TABLE I.—SHOWING PHYSICAL STATE OF ONE HUNDRED AND FORTY-FIVE PATIENTS EXAMINED.

| Description of Physical State. | Number. | Percentage. |
|-------------------------------------------------|---------|-------------|
| Good | 82 | 56.6 |
| Moderately good | 18 | 12.4 |
| Poor | 22 | 14.6 |
| Lymphatic | 14 | 9.6 |
| Poor physique and also lymphatic type | 9 | 6.2 |

By lymphatic in Table I. is meant a bodily type in which the secondary sexual characters are poorly marked or approach the feminine type. If all the lymphatic type are grouped together it forms the second largest group.

TABLE II.—SHOWING MENTAL STATE OF ONE HUNDRED AND FORTY-FIVE PATIENTS EXAMINED.

| Description of Mental State. | Number. | Percentage. |
|------------------------------|---------|-------------|
| Good | 54 | 37.2 |
| Moderately good | 32 | 22.06 |
| Poor | 26 | 17 |
| Mentally deficient | 33 | 22.7 |

Intelligence tests were used only in a limited number of those shown in Table II. but the group classed as mentally deficient were so obviously below normal mental standards as to render intelligence tests unnecessary.

TABLE III.—SHOWING CORRELATION BETWEEN PHYSIQUE AND MENTAL STATUS.

| Description of Physical Condition | Description of Mental Status | | Total Number | Percentage According to Table I. |
|-----------------------------------|------------------------------|--------------------|--------------|----------------------------------|
| | Poor Mentality | Mentally Deficient | | |
| Good | 12 | 10 | 22 | 26.7 |
| Poor | 4 | 11 | 15 | 68.1 |
| Lymphatic type | 4 | 2 | 6 | 42.8 |
| Lymphatic type and poor | 1 | 6 | 7 | 77.7 |
| Moderately good | 6 | 3 | 9 | 50 |

If the tests had been applied to all and necessary corrections made I have no doubt that some placed in the poor group would have been then placed in the mentally deficient group, bringing that group to somewhere about 30% of the total.

It is obvious that certain physical types are more often associated with poor mentality and mental deficiency than others—this correlation is more often seen with a poor physique and a lymphatic type than with any other, that is 77.7%. Next to this we find that poor physique itself is most often associated with low mental states (68.1%).

Definite aberration in sexual life was found in 54 or 37.2% of whole group. Definite organic diseases were found in 30 or 20.6%. In no cases was there any improvement in the psycho-neurotic conditions observed by treatment directed to the organic disorder.

Treatment.

The results of treatment are shown in Table IV. No treatment was used with forty-seven patients. Other forms of treatment for small groups were persuasion, explanation, rest and so forth, together with indirect suggestion.

The results of treatment cannot be expressed adequately in percentages, but it is to be noted that with analysis there was over 33% of considerable improvement as against a little over 20% with hypnosis and suggestion. There is no doubt that analysis is quite the better method of treatment, but it is impossible to treat all patients by this method owing to considerations of available time, aptitude of patient and so forth. Treatment by analysis is altogether more satisfactory to patient and doctor than any other method. In some cases the relief given is so dramatic and profound that this in itself has a highly valuable effect.

Suggestion is valuable, but in my opinion its value is definitely increased in the hypnotic state which in itself is one of perfect rest. Moreover it nearly always leads to better natural sleep which in most cases is greatly disturbed prior to treatment. Some few patients were found unreliable in their statements and actions and some refused treatment by psycho-therapy, others were judged on account of ignorance, egotism or mental deficiency to be not amenable to psycho-therapeutic measures.

Accessory Factors in Treatment. Work.

It is essential that all these patients be given occupation of some kind. I make it a rule that "no work no treatment," but it is not quite as easy to make the rule work as to formulate it.

This is one of the great drawbacks to any institutional treatment the patient has so much time on his hands which is employed in smoking and talking with others about the medical man and his methods.

It would be far more economical and probably give better results to treat a great number of these patients as out patients at a clinic if at the same time an endeavour was made to keep them at some sort of civil occupation. The hospital could then be reserved for patients who were too ill to do any work or who did not have any home in which to reside.

Food.

Food should be light and contain an abundance of raw vegetables and fruit together with milk and eggs. The ordinary hospital diet is too highly cooked and has more or less a sameness of flavour and appearance and is therefore not appetising to these patients who are often underweight and perhaps a little anaemic.

Special Accommodation.

Separate wards or special hospitals should in my opinion be provided. If these psycho-neurotics are treated in an ordinary hospital they are subjected to a good deal of uncalled for criticism by the other patients who class some of them as "macnoon"; the authority of the doctor is also gravely undermined by the same kind of criticism. Many of the long standing hospital patients get to know too much and constitute themselves as critics and judges of all the doctors and their treatment, but upon none of them are such undeserved criticisms freely passed as upon the psycho-therapeutist.

I am in a position to affirm that the chances of recovery of a certain number of psycho-neurotics is definitely lessened and in some cases actually destroyed by these influences without taking into account many other minor deterring influences such as noise at night time, deaths and so forth all of which greatly irritate many of the sufferers from these disorders.

TABLE IV.—SHOWING RESULTS OF TREATMENT.

| Form of Treatment Used | Improvement | Considerable Improvement | No Result | Total |
|-----------------------------------|-------------|--------------------------|-----------|-------|
| Hypnosis and suggestion | 26 | 10 | 12 | 48 |
| Analysis | 8 | 9 | 11 | 28 |

The Medical Journal of Australia

SATURDAY, APRIL 25, 1925.

National Health Insurance.

THE ROYAL COMMISSION appointed to inquire into the question of national health insurance has issued its first progress report. The text of this report will be published as soon as space is available in this journal. The commissioners have wandered far outside the true limits imposed on them by their reference. Many of their findings must meet with the approval of all who have studied the sociological and economical position of the Australian people, while others will be found to be either debatable or unacceptable.

The commissioners recommend the establishment of a compulsory national insurance fund with sickness, accident, invalidity, maternity and superannuation benefits. The administration of this fund should be under the control of the Government. There is a significant omission in connexion with this part of the report, in that the contributors to the fund are not defined. Mention is made of wage and salary earners, but this distinction is very vague and the only indication given of the intention of the commissioners is that implied in the statement that at present only 524,000 out of approximately 1,648,000 wage and salary earners have made voluntary efforts to provide against the event of incapacity caused by illness or accident. The scheme anticipates the age of sixteen for entry. No sickness benefit would be payable after the insured man has attained the age of sixty-five or the insured woman the age of sixty years. The statement is made that the estimated average adult wage for males working for the full week was £4 14s. 3d. on June 30, 1924, and for females £2 10s.. The wage earner is generally unable to provide unaided for the contingencies of illness. The use of the word generally is unsatisfactory in this regard. Before the proposition can be accepted that every wage and salary earner should be required to contribute to this form of insurance, it

should be ascertained what the maximum annual earnings of the 1,278,000 men and of the 370,000 women are and how many are earning over, let us say, six pounds a week or £312 a year. The claim is made that the existing systems of mutual insurance have failed in Australia. That the friendly societies have reached a very large proportion of those who need assistance in time of incapacity, cannot be doubted, even if the commissioners are justified in asserting that there is much overlapping, duplication and waste of effort under the voluntary systems. Without discussing at present the details of the proposed benefits, we suggest that a compulsory insurance of this kind should be limited to wage-earners whose gross income does not exceed a fixed amount and that wage-earners with incomes above this amount and below a second fixed sum should be permitted to join the scheme on a voluntary basis. The chief defect of the proposals, however, lies in the fact that no provision at all is made for the unemployed and the unemployable, the people who need assistance more than anyone else.

The second matter of essential importance in the report is that of medical treatment of existing disease and injury and of the prevention of disease and injury. The commissioners hold that, while a national health scheme to provide for adequate medical treatment and for the prevention of illness and accident is desirable, this scheme should be dissociated from the administration of the national insurance fund. They hold that health supervision is not necessarily a subject for insurance and that medical benefit is a matter for the health department. They mention the proposals that have been put forward, that the sum paid to the insured weekly during illness or injury should suffice to cover the private fees of medical practitioners or that the Government should engage whole-time medical officers to provide medical treatment. The second suggestion can be dismissed summarily. The medical profession would not accept it. It will be remembered that the scheme put forward by the Federal Committee embraced the former proposal. The essential difference, however, between the scheme of the Federal Committee and that lightly touched by the commissioners is that the former

included medical treatment for employed persons earning less than a fixed income, unemployed persons and unemployable persons. The commissioners have failed to recognize that national health insurance involves upon the Government a large financial responsibility which must be shared by employers. To cast the whole burden on the worker and to limit the benefit to those earning good money is to avoid the real issue.

There are many other important matters contained in the report which will be discussed in subsequent issues.

Current Comment.

VITAL CAPACITY IN HEART DISEASE.

ALTHOUGH many observers in earlier times tried to estimate the volume of respired air, it was Hutchinson in 1846 who first investigated the capacity of the lungs and the respiratory functions "with a view of establishing a precise and easy method of detecting disease by the spirometer." In spite of this study and that of many others who succeeded Hutchinson, all attempts to use the estimation of vital capacity for clinical purposes, were unavailing. With the advent of the Great War, however, the estimation of vital capacity was found to be of some service, particularly in regard to the examination of candidates for the Flying Corps. Dreyer was among those who laid stress on its value in this connexion.

It is evident that the vital capacity of normal, healthy individuals must present considerable variation. The age of the person will have some bearing and his height and weight will exert an influence on the readings obtained. It is obvious, too, that other factors have to be considered, such as the occupation and physical condition of the individual. People who have done hard, outdoor work, who have trained for athletics for long periods of time, who have played wind instruments or who have undergone courses of training in singing and voice production, will naturally have a larger vital capacity than those whose life has been sedentary. Their activities have called for larger respiratory effort and for respiratory control. If such an individual becomes affected by a cardiac condition or a lesion of the lungs, the vital capacity may be diminished, but it may still be represented by a figure at least as high as that regarded as normal for a person of identical height and weight. In a clinical assessment these facts will have to be considered.

In the estimation of normal values for vital capacity several standards have been used. These include the standing height, surface area and body weight standards. Each standard has had its advo-

cates. The surface area and body weight standards have probably been used more frequently than any other. West found that for each square metre of body surface men have a vital capacity of two and a half litres and that women have a capacity of two litres. Dreyer drew up a formula for this estimation of normal vital capacity based on the body weight and to a certain extent body surface area.

The application of vital capacity estimations to clinical conditions received a stimulus with the work of Peabody and Wentworth in 1917. They pointed out that patients with heart disease became dyspnoeic more readily than healthy subjects and that this tendency seemed to depend largely on their inability to increase the depth of their respiration. They found that this inability corresponded to a diminished vital capacity. Levison held that the vital capacity of patients with cardiac disease was roughly parallel to their dyspnoea and that this fact might be of use in differentiating true from false dyspnoea. Others such as Ulrich and Nathanson believed that the vital capacity test was of much assistance in treatment of cardiac conditions.

Dr. Thomas Ziskin has recently discussed vital capacity as a functional test in heart disease.¹ Dr. Ziskin made observations on a group of two hundred and seven patients suffering from cardiac conditions at the United States Veterans' Bureau Clinic. Only those patients were selected for study who had no complications outside the circulatory system that would in any way affect the vital capacity. A careful clinical study was made and the functional capacity of the heart determined. The patients were then placed in five groups as follows: Class I. containing those with organic lesions who were able to perform their usual physical activities; Class II. containing those with organic lesions in two sub-groups: (a) those with slightly diminished physical activity and (b) those with greatly diminished physical activity; Class III. containing those with organic lesions of sufficient severity to prevent all physical activity; Class IV. containing those who were suffering from "possible heart disease," and Class V. containing those with a potential heart lesion. The vital capacity was calculated by West's body surface formula. The normal curve used for purposes of comparison was one obtained by Shepard and Myers from the examination of 3,500 university students. Six patients fell into Class I. They had never suffered from any symptoms of heart disease and the lesion was discovered only during routine examination. The vital capacity in this group ranged from 100% to 123% of the accepted normal. The majority of the patients were either in Class II. (a) or Class II. (b). Thus one hundred and eleven in Class II. (a) had an average vital capacity of between 86% and 90% and the average vital capacity of seventy patients in Class II. (b) was between 81% and 85%. Twenty patients in Class IV. who had no organic lesion, manifested an average vital capacity of between 96% and 100%. Dr. Ziskin holds that these results tend to show that while the

vital capacity is usually reduced in the majority of ambulant patients with cardiac conditions, the range of distribution is very variable and cannot be limited by any class or group. He points out that the differences between those in Class II. (a) and those in Class II. (b) are not considerable. He also made a study of the series in an endeavour to determine whether any relationship could be traced between the type of the lesion and the vital capacity. He found that the vital capacity tended to be lower in mitral than in aortic disease and that it depended more on the severity than on the type of lesion. He concludes that although there is no doubt that the vital capacity in heart disease bears a relationship to the symptom dyspnoea, he has not been able to show that the relationship is definite or that the reduction in vital capacity is parallel to the reduction in cardiac efficiency. Several other factors must be taken into consideration in determining the cause of reduction and its relationship to cardiac efficiency. Activity of the vasomotor system must be considered as well as mechanical factors interfering with the movements of the chest wall and conditions within the chest itself. As a result of pathological examination of the lungs, Dr. Ziskin agrees with Siebeck that the primary cause of dyspnoea is an engorgement of the capillaries of the lung alveoli which in turn causes a distension of the alveolar walls and an increase of fibrous tissue with resultant inelasticity of the alveolar walls. Dyspnoea is thus due primarily to an alveolar insufficiency.

In discussing this question several points have to be remembered. In the first place we would draw attention to the fallacy of accepting the so-called normal figures. The variation in apparently healthy individuals is so wide and the same individual may by practice increase his vital capacity to such a considerable extent that the adoption of any normal standard becomes hazardous. In the second place the experience in pulmonary conditions teaches that the vital capacity is not a measure of the functioning respiratory surface. Dyspnoea represents more than an alveolar insufficiency. There is a chemical side to the question and the nervous influence in a patient with an organic cardiac lesion must not be forgotten. In fact it is open to question whether Dr. Ziskin is justified in his attempt to use vital capacity estimations as a criterion of such a complex condition as an organic heart lesion. It is not surprising that he has been unable to establish a definite relationship between the vital capacity and the cardiac efficiency.

EOSINOPHILIA IN SCARLET FEVER.

In suppurative and inflammatory phenomena it is quite common to find a relative diminution or even an absence of eosinophile cells from the peripheral circulation. In scarlet fever this is not so, for it has been shown that the number of these cells may be increased both relatively and absolutely. Gulland and Goodall maintain that the eosinophile cells are diminished at the outset of the fever and

that they increase rapidly in simple, favourable cases till the height of the disease is past. They may in their opinion number 11% on the third day. They hold that eosinophilia may persist after the disappearance of the leucocytosis which is usually present, that the more severe the condition, the longer is the eosinophile cell count subnormal and that in fatal cases the count may not rise, but that these cells generally disappear from the circulation altogether. They also state that the behaviour of the eosinophile cells may be of diagnostic value in mild cases. The opposite view was expressed by Dudgeon. He stated quite definitely that no reliable information as to the nature of the attack could be obtained by determining the number of eosinophile cells in the peripheral blood.

This question has been studied by Dr. V. Markovitch and Dr. M. Gueratovitch whose findings confirm those of Gulland and Goodall and even go beyond them.¹ They carried out their observations at the Military Hospital at Belgrade in thirty cases of scarlet fever. They recognized at the outset that the eosinophilic reaction depended largely on the clinical form of the disease. They therefore grouped the patients into three categories. The first contained those who suffered from a slight form of the disease unaccompanied by complications. The second group comprised the septic forms of scarlet fever in which complications were present. The third consisted of malignant or "hyperseptic" forms of the disease terminating in death. Twenty patients fell into the first group. These all suffered from the classical symptoms of the disease, the general condition remained good throughout and the usual course of the disease was followed. In all these patients the eosinophile count was raised from the start, in the majority the percentage was twelve and in some instances it rose to nineteen. This eosinophilia was maintained during the acute stages with slight oscillations. Towards the twelfth day of the disease when desquamation appeared, the eosinophilia began to diminish and about the twenty-fifth day a normal level was reached. In patients of the second group the eosinophile count was low during the acute stages and during complications. With improvement in the patient's condition the count rose suddenly and after remaining at the higher level for a variable time it fell gradually to a normal level during convalescence. In patients of the third group eosinophilia did not occur. Occasionally an eosinophilia of 1% was noted during the hours immediately preceding death. More rarely this phenomenon was noted during the first or second day of the disease. Drs. Markovitch and Gueratovitch also quote cases to illustrate their contention that the presence of eosinophilia will aid diagnosis in doubtful cases. They also state that the absence of eosinophilia in a patient whose condition is good, is sufficient to indicate that a rash is not scarlatiniform in origin. In conclusion they refer to the declaration of Winterfeld and Hahne that eosinophilia and desquamation indicate scarlatina.

¹ *La Presse Médicale*, February 14, 1925.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

Increased Muscle Tension and Creatine.

PREVIOUS work has shown that with increased tone in muscle there is increase in the creatine content of the muscle. J. M. Looney (*American Journal of Physiology*, August, 1924) working on the assumption that the creatine content of the blood was a function of the muscular tone and that a relaxation of muscle tone, if continued over a long period, would result in a decrease in the creatine of the blood, has determined the blood creatine of patients with involution melancholia and depressed *dementia praecox*. Both these groups were made up of patients in whom there was a general relaxation of muscular tone and a diminution in interest and attention. The creatine content was decreased in these cases. A series of ten patients with katatonic *dementia praecox* was also examined and here was found a pronounced increase in the creatine content of the blood.

Location and Nature of the Action of "Insulin."

THE phenomenon of the disappearance of dextrose from the blood under the influence of "Insulin" is now familiar, but the method of the disappearance remains obscure. J. H. Burn and H. H. Dale have endeavoured to determine whether the sugar which disappears under "Insulin" is immediately oxidized or stored in some form which has hitherto escaped detection, and what organs are concerned in the removal, whether by destruction or synthesis. Experiments were done on the isolated mammalian heart and on decapitated and eviscerated cats. Addition of "Insulin" to the perfusion fluid accelerates the removal of dextrose therefrom by the isolated mammalian heart, but the output of carbon dioxide by the heart is not proportionately increased so that the extra loss of sugar is not due entirely to increased oxidation. In the decapitated and eviscerated cat with constant infusion of dextrose "Insulin" produces the characteristic fall of blood sugar. If the blood sugar is prevented from falling by acceleration of the infusion, "Insulin" causes disappearance of sugar at many times the normal rate. The earlier stages of "Insulin" action are accompanied by increased consumption of oxygen which may be pronounced, but is seldom, if ever, sufficient for the oxidation of the extra sugar lost. The respiratory quotient of such a preparation has always been unity and has remained practically unchanged under the action of "Insulin." Immediate conversion of sugar into fat or lactic acid seems to be excluded. Since the disappearance of sugar from the cir-

culation can occur quite normally in the absence of all tissues endowed with metabolic functions except the heart and skeletal muscles, it is evident that such organs as the liver do not play a special and indispensable part in the reaction. It is thus impossible to suppose that an essential step in the disappearance of dextrose is its conversion by the liver under the influence of "Insulin" into a reactive form. The isolated hearts and eviscerated preparations from cats rendered diabetic by complete pancreatectomy have given results in all respects similar to those from normal animals.

The Constancy of the Basal Metabolism.

GRAHAM LUSK and E. F. DU BOIS (*Journal of Physiology*, October, 1924) have collected observations on the basal metabolism of men and dogs over a series of years and show that there is very little variation in any one individual. In one dog the variation over two consecutive years was only 2.9%. Zuntz at the age of forty-one years had a basal metabolism of eight hundred and four calories per square metre of surface per day and seven hundred and ninety-two calories when he was sixty-three years of age. Du Bois during a period of eleven years showed a variation of only 7.6%.

Effect of "Insulin" on Blood Volume.

J. B. S. HALDANE, H. D. KAY and W. SMITH (*Journal of Physiology*, October, 1924) have shown that the administration of "Insulin" to normal rabbits leads rapidly to a very appreciable rise in the blood volume. From the haemoglobin figures the blood was on an average diluted some 15% at the time of convulsions, although the individual variations from this figure were in some cases large. Since the total increase of fluid in the blood could not come from increased absorption from the intestine, there appears no alternative to the view that the blood is actively diluted by a fluid containing little free phosphate, sugar or lecithin coming from the tissues. The clear evidence of thirst following "Insulin" injection falls into line with this partial desiccation of the tissues. Comparative quantitative determinations in blood before and after the giving of "Insulin," particularly in the case of substances not equally distributed between corpuscles and plasma can only be accepted if this change in volume is taken into account. The osmotic pressure of serum remains the same before and after the injection of "Insulin."

The Respiratory Wave in Arterial Blood Pressure.

THE effect of respiration on the blood pressure has long been the subject of discussion and the data obtained by different observers have been very contradictory. M. B. Visscher, A. Rupp and F. H. Scott (*American Journal of Physiology*, November,

1924) have re-investigated the subject, using natural and artificial ventilation and normal and denervated hearts. It appears probable that the respiratory wave in arterial blood pressure is the resultant of a number of factors affecting the output of the heart. Most important is the lowered intra-thoracic pressure facilitating the flow of blood to the atria of the heart. Secondary in importance is the effect of the condition of the lung vessels on the flow of blood from the right to the left side of the heart. That effect is operating chiefly in opposition to the first named force, but is largely overshadowed by it in conditions of natural breathing. The impression that the inner and outer layers of the alveolar wall are pulled apart by the negative pressure within the thorax in inspiration is entirely erroneous. The only force operating is that of atmospheric pressure acting against the elastic tension of the lung. It follows that the lung vessels will be stretched in length and decreased in bore, thereby increasing the resistance to the flow of blood in the distended condition. Changes in the rate and force of the heart through its nervous control are not fundamentally responsible for the respiratory wave. Changes in the venous supply to the heart are not simultaneously reflected in the arterial pressure curve. Three heart beats usually intervene between the alteration in the inflow and the change in the arterial pressure. The inspiratory act produces a rise in blood pressure and the expiratory act a fall. The phase of respiration in which the rise appears, is dependent on the heart-respiration ratio. If it is large, the effects of a given phase will appear before its end; if it is a ratio of 6:1, the effect of one phase will show up during the next; if it is very small, there will be a superposition of antagonistic forces and the wave will almost disappear.

Pulse Rate and Heart Size.

A STUDY of the influence of the pulse rate on heart size is of interest practically in interpretation of clinical X-ray findings and theoretically for its bearing on certain problems of cardiac dynamics. W. J. Meek (*American Journal of Physiology*, October, 1924) has studied the effect of varying the heart rate in dogs on the diastolic size of the heart. He used dogs under the influence of morphine and dogs under ether anaesthesia. In the former atropine was injected and the return of the rapid pulse to normal followed. In dogs under ether anaesthesia changes in rate were secured by vagal stimulation after vagotomy. In dogs under ether anaesthesia with the thorax intact the diastolic size of the heart as shown by X-rays slowly decreases as the heart rate increases up to about one hundred and ten beats per minute. As the rate increases beyond an average of one hundred and ten, the diastolic size undergoes a very rapid decrease.

The data presented confirm Henderson's conception that the diastolic filling of the heart under normal conditions consists of two stages, one of rapid inflow and the other of diastasis. This is shown to be true for intact unanæsthetized animals. If venous pressure is maintained artificially, the heart rate may be increased as high as two hundred beats per minute without any change in diastolic size. Ordinarily the decrease in diastolic size appears at a low rate, one hundred and ten, due to the effects of the falling venous pressure.

BIOLOGICAL CHEMISTRY.

Acidity in Duodenum.

H. V. HUME, W. DENIS, D. N. SILVERMAN AND E. L. IRWIN (*The Journal of Biological Chemistry*, July, 1924) have made a study of the hydrogen ion concentration in the duodenum in a man in whom it has been possible to introduce an hydrogen electrode directly through a fistula into the duodenum and to continue observations for hours. The fistula resulted from a pistol wound and did not close after operations. The patient appeared well after some months, despite the presence of the fistulous communication from the duodenum to the surface of the abdomen. The maximal value of the reading of pH 8.23 and the minimal value pH 5.9 accord well with current views of the physiology of the duodenum. There was no definite difference in reaction after meals consisting largely of fats, carbo-hydrate or proteins. The authors point out that the acidity found by them suggests that the higher acidities obtained with a duodenal tube are due to the irritation of the pylorus by the tube and the passage of more stomach contents into the duodenum.

Milk Ash in Rhachitic Families.

S. V. TELFER (*Biochemical Journal*, June, 1924) has compared the mineral content of human milk in normal and rhachitic families. A number of specimens of human milk obtained from women of the poorer classes living in the industrial districts of Glasgow were analysed to ascertain whether any deficiency of calcium or of phosphorus was invariably associated with the onset of rickets. The milk on which infants became affected by rickets, was compared with other specimens of milk on which the infants remained free from the disease. The samples of milk were obtained by artificial exhaustion of the breast. Estimations of fats, ash, calcium and phosphates were made by the usual methods. Milk was examined from twelve mothers whose children did not suffer from rickets, from fifteen mothers with an infant exhibiting signs of rickets and from twelve mothers living in country villages. No appreciable differences in the mineral content of the milk of the mothers of

the rhachitic and non-rhachitic groups was observed, the average figures obtained being identical. A number of specimens in both groups were deficient in fats. In the milk from the mothers living in the country the lime content is less than in the groups of mothers living in Glasgow. The author notes that infantile rickets can occur when the breast milk exhibits a high calcium content. The ratio of phosphoric acid to lime is slightly higher in the milk of healthy country women than in the milk of women living in a city in poor circumstances.

Changes in Blood During Feeding.

S. A. P. EDERER has studied the composition of the blood of rhachitic rats while these are fed with cod liver oil (*The Journal of Biological Chemistry*, July, 1924). These investigations were made upon young rats weighing eighty to one hundred and fifty grammes made rhachitic by restricting them to a diet of maize, wheat, wheat gluten, gelatine, sodium bicarbonate and calcium carbonate. The author measured the viscosity, protein percentage and albumin-globulin ratio of the blood. He finds that the viscosity of the blood serum of rats rises with age. The viscosity of the serum of rhachitic rats is not altered from normal, but the viscosity of the serum of rats treated with cod liver oil is increased. There is no significant alteration in the refractive value of the serum of rhachitic rats. The albumin content of the serum of young animals is the same as that of adults. Rhachitic rats have a somewhat increased albumin content. There is a distinct decrease in the albumin content of the serum of rhachitic rats undergoing treatment with cod liver oil.

Rickets in Pigs.

S. S. ZILVA, J. GOLDRING AND J. C. DRUMMOND (*Biochemical Journal*, July, 1924) bring forward evidence that they believe demonstrates the possibility of inducing typical rickets in pigs by depriving them of the fat-soluble, anti-rhachitic vitamin. Their investigation started from the observation that pigs fed on a diet which included dried separated milk in large quantities, but which was otherwise free from fat-soluble vitamins, grew well, but eventually displayed rickets. Previous studies had shown that pigs deprived of fat-soluble vitamin grew poorly and exhibited osteo-porosis, but not rickets. In this research two sets of experiments were carried out. In one all the animals were kept in the absence of direct sunlight. In the second the conditions were similar except that two animals were exposed to direct sunlight and given cod liver oil in addition. In the first experiment eleven pigs, aged sixty-two days, were fed on toppings, barley meal, dried separated milk, animal charcoal, swedes and chalk. The average intake of CaO was 30.75 grammes (1.085 ounces) and of P₂O₅ 30.05 grammes (1.06 ounces), giving a ratio of cal-

cium to phosphorus of one to 0.6. Nine of these pigs became lame after about sixty days, became worse and were slaughtered. Their bones were examined by Professor Korenchovsky. Two pigs were treated, one with cod liver oil and the other with cream, and eventually recovered. Four of these pigs showed undoubted histological evidence of rickets, the remainder showing only osteo-porosis. In the second experiment eight pigs were used and two were exposed to direct sunlight. Three were given apples as an antiscorbutic. Four animals became affected by rickets, two became affected by scurvy and two which were allowed sunlight and cod liver oil, grew well. The authors ascribe the success of their experiments to the amount of fat-soluble vitamin present in the dried milk. In their earlier experiments fat-soluble vitamin was so reduced in the diet that the animals failed to grow. In these experiments enough fat-soluble vitamin was allowed to promote growth with the result that rickets occurred owing to the absence of fat-soluble vitamin from another source. The authors point out that on the assumption that these observations hold true for human beings, there is risk in using dried separated milk "fortified" with inactive fats for feeding infants. Professor Korenchovsky regards proliferation of cartilage and abnormal quantity of osteoid tissue as characteristic of rickets. The authors lay stress on the fact that there was abundance of mineral matter in their diet and that the ratio of calcium to phosphorus is not favourable to the production of rickets as suggested by the experiments of Orr and his collaborators.

Durability of Fat-Soluble Vitamin.

E. POULSSON (*Biochemical Journal*, July, 1924) has tested the amount of fat-soluble vitamin in a sample of cod liver oil produced in 1893 which had been kept in ordinary, colourless, practically full glass bottles. It was tried in the usual manner upon rats which for an adequate time had been living upon a diet freed from fat-soluble vitamin as far as possible. Daily doses of two milligrammes of cod liver oil produced growth for the first week only. Doses of three milligrammes and five milligrammes daily led to growth, more rapid with the larger daily dose. It is not possible to have any definite opinion as to whether the cod liver oil had preserved its original potency. Presumably portion of its activity had been lost. Investigations of numerous samples of Norwegian cod liver oil show that the great majority are potent in daily doses of two milligrammes. Only one oil with a potency of less than one milligramme has been observed. This oil was thirty-one years old at the time of this test. Previously an oil nine years old had been noted to contain the major part of its fat-soluble vitamin.

British Medical Association News.

SCIENTIFIC.

A MEETING organized by the South-Western Division of the Victorian Branch of the British Medical Association was held at Warrnambool Hospital, Warrnambool, on the afternoon and evening of March 7, 1925, DR. STANLEY ABGYLE, President of the Victorian Branch, in the chair.

A number of members of the Council of the Branch journeyed from Melbourne to attend the meeting and the western district of Victoria was very well represented, many of the country practitioners having driven long distances in order to be present.

The function was an unqualified success both scientifically and socially and many appreciative references were made to the enthusiasm and hospitality of the members of the South-Western Division. Sixteen members of the Division and nineteen visitors were present.

DR. STANLEY ABGYLE, at the outset of the afternoon session, took the opportunity of congratulating the South-Western Division on the inauguration of divisional meetings in Victoria. The occasion of a divisional meeting held remote from the metropolis for the first time was historic and members of the Council had journeyed from Melbourne with the twofold object of deriving advantage from the discussions and of showing their practical sympathy with a pioneer movement. Divisional meetings, commonly held in England, presented special difficulties in Australia on account of the long distances separating the men in country districts and the greater honour was, therefore, due to the members of the South-Western Division for their energy and enterprise. He wished the meeting every success and hoped that the example set by the South-Western Division would be followed by other divisions in the State of Victoria. The solution of the problem of decentralization and of the arrangement of important medical discussions elsewhere than in the city, would be much advanced by the action of the South-Western Division.

Diagnosis of Hydatid Disease—Casoni Reaction.

DR. C. H. KELLAWAY (Melbourne) read a paper entitled: "The Utility of the Casoni Reaction in the Diagnosis of Hydatid Disease" (see page 417). He also gave a practical demonstration of the technique of the performance of the test on two patients selected by Dr. H. I. Holmes. The first was a young man upon whom Dr. Holmes had operated five years previously; he had had two hepatic hydatid cysts. The second patient, a woman, aged forty-one years, had been relieved by Dr. Holmes of a large hydatid cyst in the left lobe of the liver on February 10, 1924.

In both subjects Dr. Kellaway demonstrated an immediate reaction.

DR. R. O. DOUGLAS (Hamilton) congratulated Dr. Kellaway on his essentially practical paper and demonstration. When the meeting was arranged he was not without a fear that some of the subjects might be treated in a manner too ultra-scientific to be of immediate practical use to country practitioners. Dr. Kellaway had wisely avoided the discussion of the theoretical basis of the Casoni reaction. He had made them acquainted with the method of carrying out a test which was not only new, but which was likely to be particularly useful in the western district, as two years' residence in that part of the State had convinced him that hydatid disease was very prevalent.

He wished to inquire of Dr. Kellaway regarding the conveyance and storage of the hydatid fluid used in the Casoni reaction. How long would the fluid retain its efficacy? Could it be transmitted by post and thereafter kept in an ice-chest?

Dr. Kellaway had been particularly careful in warning them of the occurrence of "pseudo-positive" results, but it occurred to him that if the immediate reaction were not genuine, the delayed reaction would not supervene. He asked if a good delayed reaction could be taken as con-

clusive of a positive response in a case in which the observer was doubtful about the interpretation of the immediate reaction.

In conclusion, Dr. Douglas said that he would be interested to hear Dr. Kellaway's experience of the Casoni reaction in those patients in whom the cyst was subsequently shown to be calcified. On the surface it would appear that calcification might be regarded as equivalent to death or removal of the cyst, in which event they could not expect much assistance from the complement fixation reaction.

DR. J. B. DONALDSON (Linton) asked if normal serum might be used in making the control injection in the performance of the Casoni reaction.

DR. F. J. BONNIN (Ararat) asked if suppuration in the liver apart from a hydatid cyst affected the complement fixation reaction. He understood that when suppuration occurred in a hydatid cyst the delayed phase of the intradermal reaction was suppressed.

DR. A. H. DUNSTAN (Warrnambool) asked if he were correct in the impression he had gathered that the Casoni reaction was obtained in greater degree prior to operation than after. How would the reaction be affected by the presence of a residual cyst?

DR. S. C. FITZPATRICK (Hamilton) said that with the assistance provided by the workers at the Walter and Eliza Hall Institute he had been enabled to make some interesting clinical observations in the diagnosis of suspected hydatid disease. He recalled the case record of a man, forty-five years of age, who had presented a rounded, regular tumour in the epigastrium which in its physical characters was very suggestive of a hydatid cyst. The finding in the complement fixation reaction had not provided any confirmatory evidence and at that stage he had received information concerning the pathological condition which had led to removal of one of the patient's eyes two years earlier. This was established as a sarcoma and he anticipated that the tumour in the liver would ultimately be shown to be a metastatic malignant growth.

In another patient a calcified hydatid cyst the contents of which were putty-like in character, had been disclosed by operation. The blood serum of this patient had failed to give a reaction in the complement fixation test and he understood that under the conditions he had indicated absence of reaction was the rule by the complement fixation test.

DR. H. I. HOLMES (Warrnambool) discussed the duration of hydatid disease. Symptoms due to the presence of a cyst might be manifested within a short time of infestation as was exemplified by the fact that he had met with hydatid disease in a child of two years of age. He had also seen it at the other extreme of eighty-one years and the longest period of existence of a cyst within the human body was in his experience twenty-six years. He had seen several patients in whom it was reasonably certain that the parasite had been present for eight or ten years. He wished to inquire regarding the possibility of the Casoni reaction being influenced by the length of time the cyst had been in existence.

Dr. Holmes asked if the intradermal reaction dependent on the presence of a live cyst was likely to be modified in any way by the occurrence of suppurative or of retrogressive changes in a neighbouring cyst; this was a state of affairs not uncommonly observed. Was the Casoni reaction affected by the sterility or fecundity in brood capsules and daughter cysts of the parasite? He inquired further if the skin test differed in any way in the nature of the response when those cysts which appeared to proliferate by exogenous budding, were encountered. It had been held, especially by veterinary workers, that the parasitic cyst which reproduced by exogenous budding, was different in nature from the more usual cyst in which the budding was endogenous. He was not prepared to venture an opinion on this point, but it occurred to him to wonder if the biological diagnostic reactions might assist in its elucidation.

Dr. Kellaway, in reply, said that he had omitted to mention that the diagnostic reagent in the Casoni test, hydatid fluid, would keep for six months on ice. The fluid contained only a small trace of protein, but if not sterile it was very unstable. He thought that sterile hydatid fluid might retain its efficacy as a reagent for perhaps a month in the absence of refrigeration.

With reference to the point raised by Dr. Douglas that the occurrence of a delayed reaction might be relied upon to distinguish a true reaction from a pseudo-positive immediate result, Dr. Kellaway said that a "pseudo-positive" result was never followed by the highly specific delayed reaction. Unfortunately the delayed reaction did not always occur; he had indicated that it was very frequently suppressed when suppurative processes obtained in the cyst and in general the assistance of the delayed reaction was forthcoming in about 60% of all cases. Dr. Donaldson's question reminded him to mention that in the hydatid fluid reagent, no matter how carefully collected, there was always the possibility of the presence of minute traces of sheep's serum or protein. If the patient were for any reason sensitive to sheep protein, traces of it in the hydatid fluid used in the intradermal test would determine a pseudo-positive result.

The Casoni reaction was not affected by the occurrence of retrogressive and calcareous changes in the cyst. During its period of active growth the cyst had brought about sensitization of the patient to hydatid protein and the anaphylactic state, in the same way as that dependent on protein sensitization in general, persisted for many years.

In reply to Dr. Bonnin, Dr. Kellaway said that suppuration in the liver apart from the hydatid cyst could not affect the complement fixation reaction. The response to this test was intensified when suppuration affected the hydatid cyst. Under such circumstances very high readings were frequently obtained, as many as eighty units of complement being sometimes deviated, but the Casoni reaction did not proceed further than the immediate wheal, the delayed reaction being suppressed.

He found the question put by Dr. Dunstan relating to a residual cyst somewhat difficult to answer on account of the want of a good series of examples of such cases. He might say in general terms, however, that when a cyst had been overlooked at operation or for some reason not extirpated, the subsequent type of intradermal reaction was likely to be that in which the immediate wheal only appeared. If a new cyst were to be found, the second phase of very strong delayed reaction might be anticipated.

He had been interested to hear of the patient referred to by Dr. Fitzpatrick. In that patient a very probable sarcoma of the liver had given rise at first to clinical suspicion of hydatid. The question had been raised as to possible non-specificity of the Casoni intradermal test for hydatid in the presence of sarcoma, but he did not believe that there was any such fallacy and regarded the Casoni reaction as based on specific sensitization to hydatid protein.

With reference to the points raised by Dr. Holmes, Dr. Kellaway said that when a suppurating cyst existed alongside an uncomplicated cyst, that in which suppuration had occurred, would be dominant in determining the character of the intradermal reaction. Multiple cysts were by no means uncommon and when one of them had become infected with pyogenic organisms, the appearance of an immediate wheal and suppression of the delayed reaction were to be expected. When a retrogressing hydatid existed alongside a live cyst, the character of the reaction would be determined by the live parasite.

In conclusion, Dr. Kellaway said that he believed that in Australia there was only one parasite identified with hydatid disease and that there was no such thing as *Echinococcus alveolaris*. When "exogenous budding" was observed it was invariably in bone and it was determined by the nature of the environment rather than by any essential difference in the parasite from the echinococcus as commonly observed in soft tissues.

Asthma and Hay Fever.

DR. L. A. IVAN MAXWELL (Melbourne) delivered an address on those aspects of protein sensitization which relate particularly to asthma and hay fever. With the aid of lantern slides he illustrated the early experiments of Richet, the origin of the conception of anaphylaxis and the evolution of modern views according to which asthma and hay fever are anaphylactic manifestations.

In the course of a demonstration of the technique of testing for pollen and food protein sensitiveness Dr. Maxwell indicated his preference for the "scratch" method as against the intradermal test. Pseudo-positive results were prone to be obtained with the intradermal technique and if it were adopted in the case of a highly sensitized person, there was risk of dangerous reaction.

Dr. Maxwell considered the subjects of asthma as in two classes, (i.) those sensitized to proteins and (ii.) those in whom no protein sensitization could be demonstrated. The first class included persons in whom the seasonal incidence of asthma or hay fever gave the key to the basis of the disorder. The group embraced also asthmatics in whom the incidence of symptoms was non-seasonal and in whom the sensitive state had been induced by animal dandruff, certain food stuffs or bacterial protein. In the second class were placed those in whom asthma depended on metabolic, neurogenic factors and the toxic effect of bacterial infection apart from sensitization to bacterial protein.

The lecturer emphasized the importance of minute inquiry in regard to the patient's clinical history; a thorough physical examination which embraced the nose and accessory sinuses, was no less important.

If the symptoms were seasonal in incidence, cutaneous tests with the pollen of several grasses should be performed. Specimens of rye grass, cocksfoot, prairie grass and soft brome were exhibited, these four being responsible for more hay fever than the sum of that due to all the other varieties. Capeweed was also a very frequent cause. Dr. Maxwell employed a botanical chart in the form of a wall map in order to demonstrate the mode of production of pollen grains. Certain flowers, such as dahlias, asters, sunflowers, cosmos, calliopsis, pollinated in the autumn and a few people were sensitive to the pollens distributed from them. Of all hay fever patients 95% were sensitive to grasses or to capeweed, capeweed belonging to the order *Compositae*.

Included in the testing set were sixty-five food proteins, but in practice he used eight or ten only as experience had shown that the significant protein was generally found among a certain few. Egg-albumin, the cereals oat and wheat and fish were the foods which most frequently occasioned trouble.

He did not often employ bacterial protein in cutaneous tests. Walker had reported the finding of 10% in a series of asthmatic subjects who were sensitive to bacterial protein, but in the Mayo Clinic of two hundred persons suspected of sensitization to bacterial protein the cutaneous tests yielded no results in all. Detailed bacteriological examination was required and the bacterial proteins used for testing should be derived from the several bacteria isolated in pure culture from the patient. It appeared also that a method of testing more delicate than those hitherto employed was necessary.

In the event of all the skin tests for protein sensitization failing to disclose such a basis for the patient's asthma consideration was to be given to the possibility of its metabolic origin. He used the term "metabolic origin" to denote the absorption from the digestive tract of some substance capable of causing constriction of the bronchioles. Histamine was known to have this property; it was readily formed from the amino-acid, histidine, which was elaborated in the ordinary process of digestion. Normally not sufficient histamine was produced to exercise any action.

The effect of histamine in initiating contraction of the bronchioles was strikingly illustrated in a lantern slide.

Dr. Maxwell said that for some time he had made a practice of examining the gastric content of asthmatic patients whom he judged to be of this type. He had found that the

test meal indicated a complete lack of free hydrochloric acid in about one-third and diminution in an approximately equal number. It had been interesting to note that in many the administration of hydrochloric acid as the sole treatment had given complete relief of the asthmatic symptoms. To be effective the hydrochloric acid must be given in large doses—at least four cubic centimetres (one fluid drachm) of the pharmacopoeial dilute acid in a tumbler of water. Doses of six or eight cubic centimetres might even be necessary. He recommended that the acid should be sipped throughout a meal.

Another important investigation concerned inquiry into the possible presence of infective foci located perhaps in the nasal accessory sinuses. Tonsillar and dental sepsis should also receive attention. The aid of the rhinologist and frequently the radiologist was very necessary except perhaps in those in whom there was a clear issue of protein sensitization. Very frequently more than one factor was operating. After repeated attacks of congestion of the nasal mucous membrane in a patient sensitive to pollen bacterial infection was prone to supervene.

He had mentioned the dubious neurogenic factor in asthma. Experimental stimulation of the vagus induced constriction of the bronchial tubes and it was possible that such constriction occasioned by reflex vagal excitation resulted in asthma in a small proportion of instances.

Dr. Maxwell proceeded to a discussion of the treatment of asthma.

In the acute attack the first measure should be the administration of adrenalin by hypodermic injection of 0.3 to 0.6 cubic centimetre (five to ten minims) of a one in one thousand solution of adrenalin chloride. Adrenalin gave relief by its stimulating action on the pulmonary sympathetic fibres and resultant relaxation of the bronchioles. Some patients did not respond well to adrenalin and it was generally found that in such the dominant factor was bacterial infection rather than protein sensitization.

After discussing the utility of atropine and morphine Dr. Maxwell mentioned that acetyl-salicylic acid would frequently cut short an attack when other measures failed. On the other hand acetyl-salicylic acid occasionally precipitated violent asthma; its use was entirely empirical and he knew of no pharmacological basis for it.

In dealing with asthma based on protein sensitization the objective in treatment was desensitization. Dr. Maxwell referred again to experimental work and exhibited lantern slides showing the progress of experimental de-sensitization in animals rendered artificially sensitive to protein. He discussed in detail the preparation and sterilization of the therapeutic protein solutions which were made in dilutions of 1 in 20, 1 in 200, 1 in 2,000 and 1 in 20,000. Injections were given every fourth day, the initial doses being those of the highest dilution. When advancing in the lowest dilution the physician should exercise great care to avoid the risk of precipitating an anaphylactic crisis. The desensitizing course should be given early in the spring before the pollination of flowers and grasses liberated the pollen into the atmosphere. The number of injections was influenced by the length of time the patient had suffered from asthma and the degree of sensitization. At least ten doses, however, should be given. In practice the desensitization of a patient susceptible to animal dandruff was found relatively difficult as compared with that in pollen sensitization.

Desensitization in respect to food proteins had been attempted extensively in America, but the results had been disappointing. If the offending food stuff were identified, it was best to eliminate it from the diet.

Treatment by bacterial vaccines did not give the same measure of success as that attending the use of pollen solutions.

Peptone, a product of protein disintegration, had been employed by both intravenous and intramuscular injection. There was a danger of severe reaction following the intravenous injection of peptone solution, but time did not permit of a discussion of this line of treatment.

Desensitization to pollen was not likely to be successful if nasal suppuration were neglected; these two items in treatment were mutually dependent if success was to be achieved.

The subject of hay fever was bound up with that of protein sensitization. True hay fever, distinguished by sneezing and rhinorrhœa at the seasonal periods spring and autumn, was to be considered apart from false hay fever in which there was no seasonal incidence. The subjects of true hay fever reacted to the skin tests for protein sensitization, while those of the spurious did not.

In conclusion Dr. Maxwell mentioned as an interesting observation that he had met three subjects of hay fever who seemed to be sensitive to face powder. Orris root entered into the composition of many face powders and in each of these three patients a strong reaction to orris root was obtained by the cutaneous test.

Dr. J. MORLET (Camperdown) asked if he were correct in the inference that in testing for sensitiveness to food protein those derived from egg-albumin, fish, oat and caseinogen sufficed.

Dr. W. KENT HUGHES (Melbourne) said that as a rhinologist he had been very interested in the able exposition of the subjects of asthma and hay fever from the standpoint of the immunologist. He had been brought up to regard asthma from what might be termed a "nasal point of view" and he thought that there was some danger of losing sight of the aetiological importance of pathological conditions of the nose.

It was true that asthma might occur in persons in whom no nasal disease was apparent and equally true that many of the subjects of asthma displayed gross nasal lesions.

He was not persuaded that suppuration in one or other of the nasal accessory sinuses of itself played any part in the production of asthma, but attached much importance to deformities of the septum and polypoid disease of the nasal mucous membrane. The proportion of cures attendant on efficient treatment of the nose alone was fairly encouraging and he had yet to see an asthmatic in whom gross nasal disease or abnormality existed who was not much benefited by rhinological measures.

As he had indicated, the pathological conditions which he regarded as of most significance in asthma and hay fever, were deviation of the septum and polypoid disease of the sinuses. Both were frequently dealt with inefficiently. Resection of the septum was not properly performed if that part of it situated highest and farthest back were left behind and he was afraid that such was very often the case. Polypi were frequently attacked in an inadequate manner with snares and forceps when a radical operation was necessary for a complete clearance.

In the treatment of hay fever every consideration should be given to the state of the nose. However much pollen might aggravate hay fever, he was convinced that it was mainly if not absolutely due to nasal lesions. In children he had never seen an asthmatic who was not relieved, temporarily at all events, by treatment of pathological conditions of the nose.

He was astonished that more use was not made of the treatment of Francis in patients with asthma in whom the blood pressure was high. He and Dr. Robertson, of Brisbane, had for many years endeavoured to impress its usefulness on the profession.

The special treatment advocated by Francis consisted in cauterization of the septum at a dull heat and he would go so far as to say that unless gross pathological lesions contra-indicated it, this painless and most effective method of control should be utilized for all patients with high blood pressure. He would include with those evincing symptoms of asthma, the subjects of migraine and *angina pectoris* and would extend it to those who suffered from general ill-health without a prominent symptom.

DR. J. F. WILKINSON (Melbourne) said that Dr. Maxwell's analyses of the gastric content in asthmatic patients prompted him to urge practitioners generally to avail themselves more of the information to be gained by examination of a test meal. Not only in asthma but throughout medical practice much valuable knowledge was to be

obtained by this method. It was such a simple procedure that he wondered that it was not more frequently adopted. He urged that the test meal should become a routine measure in clinical investigation; mistakes such as operating for chronic appendicitis when the patient needed only hydrochloric acid would thereby be reduced in number.

Withdrawal of gastric contents by the Rehfus tube was easy and the chemical analysis simple. Three determinations at one, one and a half and two hours after the meal would supply all the information required and it was not often necessary to carry out the full technique of the fractional test meal in which samples were withdrawn every fifteen minutes. With reference to the length of time during which administration of hydrochloric acid might be necessary in the correction of achlorhydria, Dr. Wilkinson said that no rule could be stated, but the period might extend to years. The underlying cause of the absent or diminished secretion was often obscure; in some instances it might be congenital and in others severe shock seemed to operate in this manner. The glands of the gastric mucosa, once disturbed, seemed very slow to recover. Restoration of the normal function of the glands was not so delayed in those cases in which depression resulted from chronic gastritis, provided appropriate measures were adopted. Much mucus in the gastric content was the distinguishing feature of chronic gastritis.

He was in agreement with Dr. Maxwell that relatively large doses, for example, four or six cubic centimetres (one or one and a half fluid drachms), of hydrochloric acid should be given, but he preferred to administer it from thirty to sixty minutes after a meal rather than concurrently with taking food. There was little or no acid in the stomach during the first hour of digestion under normal circumstances and it seemed more consistent with physiology to allow a little time to elapse before supplying acid.

The variety of factors in asthma indicated the need for thorough examination. If diminution or absence of the gastric hydrochloric acid were coexistent, treatment should be adopted to remedy the defect. He was disposed to agree with Mr. Kent Hughes in the matter of nasal infection and suppuration and considered suppuration a much less potent factor than nasal obstruction.

In conclusion, Dr. Wilkinson commented on the dose of adrenalin suggested by Dr. Maxwell; he favoured smaller doses, such as 0.12 or 0.18 cubic centimetre (two or three minimis) and had generally found the drug efficient in these amounts.

DR. L. S. LATHAM (Melbourne) said that all present must have been intensely interested in Dr. Maxwell's demonstration of the means by which relief might be afforded to many patients affected with asthma and hay fever. While the process of desensitization involved careful work for both patient and medical attendant, much also depended on the relatively simple matter of the clinical history. It was well to launch the patient on a minute self-investigation in the endeavour to discover any association between his asthmatic attacks and contact with animals or the taking of any particular food. He had found occasionally that the factor precipitating asthma had been contact with feathers as they occurred in pillows and eider-down quilts. Substitution of other fillings for feathers in pillows and quilts had sufficed to afford relief in some cases.

With Dr. Wilkinson he advocated smaller doses of adrenalin than those suggested by Dr. Maxwell. He was in the habit of making the injection himself and gave 0.12 cubic centimetre (two minimis), in separate doses of 0.06 cubic centimetre with a short interval between them.

DR. S. C. FITZPATRICK (Hamilton) asked if sensitization to catgut, a protein frequently introduced into the human body, had ever been recorded. He had twice observed what had apparently been cutaneous manifestations of sensitivity to a certain soap.

DR. A. L. KENNY (Melbourne) drew attention to the fact that it was the observation of the frequent association of polypoid disease of the nasal mucous membrane with asthma that led to the idea that very many cases of asthma were due to nasal disease. In agreement with Dr. Kent

Hughes he was of opinion that nasal suppuration apart from polypoid change was not a frequent cause of asthma.

He had observed coating of the nasal mucous membrane at the entrance to the nostrils as far back as three centimetres with toilet powder in females and could quite appreciate the fact that such was a potent cause of hay fever and asthma, due, as suggested by Dr. Maxwell, to the orris root which entered into the composition of the powder.

DR. HENRY LAURIE (Melbourne) recalled some of his experiences in the treatment of hay fever before the immunological basis held to be so important had been conceived. He referred to one patient who had suffered from hay fever of regular seasonal incidence. Every spring the disorder had recurred and had been preceded for a week or so by loss of the sense of smell. On one occasion, after the attack was well established, he had injected mixed coryza vaccine with the gratifying result that the symptoms had subsided almost at once and the patient's sense of smell had returned. In the two following years he had given the vaccine in the prodromal period of loss of sense of smell; the patient had suffered no hay fever and had had no further attacks. He recollects several similar experiences and suggested that in such cases catarrhal infection was the exciting cause protection against which enabled the patient to avert the attack of hay fever.

He had employed peptone solution by intravenous injection, but had not been satisfied with the results. In making the intravenous injection it was necessary to be particularly careful to inject slowly as peptone was by no means free from danger if introduced rapidly into the circulation.

DR. S. S. ARGYLE said that the subject under discussion presented a difficult problem, inability to discover and deal with the cause of which often brought much undeserved discredit on the medical profession. There was probably more than one pathological basis for the train of symptoms designated as asthma. Did Mr. Maxwell draw any distinction between bronchial asthma and asthmatical bronchitis? Hereditary vasomotor excitability was also a factor and, given that, a variety of causes might occasion asthma.

DR. MAXWELL, in reply to Dr. Morlet, said that he had mentioned a few proteins only in order to save confusion. Although a patient might be sensitive to any of a great number of proteins, the most likely would be found among the cereals oat and wheat, egg-albumin, fish and caseinogen.

With reference to the remarks of Dr. Wilkinson concerning the best time to administer hydrochloric acid, Dr. Maxwell said that he preferred to give it concurrently with food, because in the normal person the residual gastric secretion contained free hydrochloric acid. The gastric juice secreted immediately after the taking of food contained hydrochloric acid, but it was combined acid and as such would not be detected by di-methyl-di-amido-azobenzol. Pepsin acted only in the presence of free hydrogen ions. He always inquired regarding feather pillows and although he had not met with sensitiveness to feathers, many instances had been reported.

He suggested that when bad reactions followed the injection of adrenalin, it was possible that the drug had been injected into a venule.

In reply to Dr. Fitzpatrick, Dr. Maxwell said that he had not heard of sensitization to catgut, although as catgut contained protein, its occurrence was theoretically possible. If the soap mentioned by Dr. Fitzpatrick were a true soap, it should be incapable of inducing the sensitive state as it should contain no protein. He suggested that free alkali in the soap was the cause of skin eruptions.

He agreed with Dr. Laurie regarding the part played by bacterial infection. Certain patients had done well with bacterial vaccines along with protein desensitization.

Dr. Argyle had asked if he drew any distinction between bronchial asthma and asthmatical bronchitis. Time did not permit of a present discussion of this point, but he had considered it fully in his paper read at a meeting of the Victorian Branch in September, 1923, and published in THE MEDICAL JOURNAL OF AUSTRALIA of November 10, 1923.

Renal Stone and Hydronephrosis.

DR. J. T. TAIT (Melbourne) read a paper on "The Diagnosis of Renal Stone and Hydronephrosis" (see page 418). The paper was profusely illustrated with lantern slides prepared from excellent skiagrams.

DR. H. FLECKER (Melbourne) discussed the radiological diagnosis of renal calculus. There was no doubt that stones in the kidney and urinary tract were frequently overlooked through faulty technique on the part of the radiographer. He urged the routine use of the Potter-Bucky diaphragm and the paramount importance of securing immobility of the abdomen during exposure of the kidney. This involved suspension of respiration.

In a clear skiagram the outline of both kidneys could generally be traced and when the ureter was filled with a contrast substance the actual thickness of renal tissue could be appreciated. In hydronephrosis it should be possible to demonstrate reduction in the depth of kidney substance.

In the diagnosis of vesical stone cystoscopic examination was of the first importance, but radiographic investigation was often indispensable. The bladder might be filled with a contrast substance, such as sodium iodide, or with air for the radiographic detection of such calculi as would not be seen in cystoscopy. Such were those situated behind an enlarged prostate or in a diverticulum of the bladder.

DR. S. C. FITZPATRICK (Hamilton) exhibited radiograms as illustrative of the value of pyelography. The films had been obtained in the course of general practice, the patient being a lady of fifty years of age who had been troubled with pain in the right loin for a period approximating twenty years. The pain radiated to the abdomen and to the right hip joint and at intervals the patient was prostrated by severe attacks resembling migraine. From time to time she had undergone the operations of fixation of the uterus, appendicectomy and nephropexy.

He had performed a cystoscopic examination in conjunction with a urea concentration test by which he determined that the amount of urea in the urine collected from the right ureter was 0.5% only as compared with 1.5% in the urine from the bladder. The pyelograms exhibited were then taken and they disclosed hydronephrosis, the kidney being in low position on the right side.

DR. H. I. HOLMES (Warrnambool) said that he felt very strongly that acid sodium phosphate should not be given to a patient whose urine was alkaline and ammoniacal. He adduced two instances in which rapid deposition of phosphatic calculi had followed the exhibition of acid sodium phosphate in the presence of urine of the character indicated. If a crystal of magnesium sulphate and a few drops of solution of ammonia were added to the urine of a patient receiving acid sodium phosphate, a heavy deposit of ammonium magnesium phosphate would ensue.

MR. FAY MACLURE, O.B.E. (Melbourne), after expressing his appreciation of Dr. Tait's paper, enunciated several rules governing the surgery of renal calculus.

(i.) A patient should never be subjected to operation for chronic appendicitis until the surgeon had done his best to satisfy himself that no renal lesion existed. He constantly emphasized the importance of this to students and an aphorism relating to the point contained a reference to a "scar in the front and a stone in the back."

(ii.) Operation should never be undertaken on the evidence of an X-ray shadow alone. The shadow must be proved to be a calculus in the urinary tract and Dr. Tait had admirably demonstrated the means at hand for so doing.

(iii.) Surgical measures for the removal of a renal or ureteric calculus should not be undertaken unless the operator were prepared to remove the kidney also. Serious disorganization of the kidney or even post-operative haemorrhage might necessitate the removal of the organ. It was, therefore, necessary to make a complete investigation of the urinary system prior to operation.

(iv.) Renal calculi whenever possible should be removed through the pelvis of the kidney rather than by nephrolithotomy. Unfortunately it was not always possible to

avoid incision of the kidney, but the risks of post-operative haemorrhage and damage to the kidney were thereby increased.

Rheumatoid Arthritis.

DR. HENRY LAURIE (Melbourne) opened a discussion on the treatment of rheumatoid arthritis. He dealt particularly with protein shock therapy as it was represented by intravenous injections of *Bacillus coli* vaccine and said that on the whole this method of treatment had given very much better results than any other.

It was necessary at the outset to definite rheumatoid arthritis. Unfortunately number of terms were in common use and were more or less indiscriminately employed. *Arthritis deformans* embraced two conditions which were to be sharply distinguished from each other, osteo-arthritis, a disease of later life and characterized by bony hypertrophy and rheumatoid or infective arthritis in which inflammatory changes affected particularly the periarticular tissues.

Dr. Laurie demonstrated the pathological changes in rheumatoid arthritis and their distinction from those of osteo-arthritis by means of lantern slides.

Protein shock therapy was of no use in osteo-arthritis and injudicious selection of the type of arthritis for treatment in this manner accounted for many of its apparent failures.

Various proteins might be used. One of the first to be tried was milk by intravenous injection and although it occasioned a certain reaction, such was variable and could not be predicted. Peptone had been utilized, but it was not without its dangers and *Bacillus coli* emulsion possessed the advantages of convenience and regularity in its effects.

Observations made at the Alfred Hospital had shown that immediately after the intravenous injection of *Bacillus coli* there was an almost complete absence of polymorphonuclear leucocytes from the peripheral blood. The rigor and rise of temperature supervened and at the height of the fever the polymorpho-nuclear leucocytes numbered from 20,000 to 30,000 per cubic millimetre. What became of the leucocytes he could not suggest; it seemed to be a case of *sauve qui peut*, but it had been interesting to note by Arneth counts that the new leucocytes were all young forms and were therefore presumably active and possessed of good phagocytic power.

With reference to the frequency of the injections, Dr. Laurie said that they should be given every two or three days and in some instances daily. Failures were often to be attributed to the fact that too long an interval had been allowed to elapse between injections. In illustration Dr. Laurie quoted the case of a patient whom he had taken into hospital and to whom he had given a daily injection of *Bacillus coli* vaccine for a week. This course had sufficed when fifteen or twenty injections at too long intervals had formerly effected no improvement.

Failure was to be anticipated when the disease was of long duration and when the patient's general condition was consequently bad.

Dr. Laurie exhibited the temperature chart of a girl who had been admitted to hospital suffering from acute arthritis. The condition had first been diagnosed as acute articular rheumatism, but no response had followed the administration of sodium salicylate. This patient had then received an intravenous injection of fifty millions *Bacillus coli*; her temperature had then risen to 40.5° C. (105° F.), but had fallen to normal on the following day and had not risen again.

A number of charts recording a similar course of events were shown.

Dr. Laurie emphasized that the use of protein shock therapy did not permit of the neglect of other methods of treatment. Orthopaedic measures, such as breaking down articular adhesions under anaesthesia might be necessary, but there was no question that *Bacillus coli* therapy employed early in the course of rheumatoid arthritis had frequently rendered it possible to avoid splinting when it would otherwise have been required.

There must be some residual deformity in many instances, but if they could relieve pain and render the joints more supple, they had achieved a very great deal.

DR. W. R. FORSTER (Melbourne) said that he had employed vaccines intravenously, particularly *Bacillus coli*, for over three years and although in a few cases the results had been extremely good, especially with regard to relief of pain, he could not say that his measure of success approached that which apparently attended Dr. Laurie.

In his experience permanent cure of rheumatoid arthritis had been very rare. Of a series of thirty patients he could not say that more than four or five had been permanently relieved. He had found that treatment must extend over a prolonged period and that in certain cases doses containing as many as one thousand millions of *Bacillus coli* per cubic centimetre seemed to be tolerated without great reaction. Intravenous injections of *Bacillus coli* vaccine did not appear to induce any lasting immunity to infection by the colon bacillus specifically or to avert recurrent attacks in rheumatoid arthritis.

He had tried the effect of intravenous injection of colon bacillus vaccine in chronic bacillary pyelitis which was notoriously unresponsive to treatment. He referred in detail to the case of a female patient, aged sixty-eight years, whom he had been called upon to treat for chronic pyelitis. After the failure of ordinary vaccine therapy and all forms of medicinal treatment became evident he had conceived the idea of intravenous injections of *Bacillus coli* vaccine. The patient had received a course of seven injections and the dosage ranged from ten to two hundred and fifty million organisms. At the outset of treatment in this manner agar plates prepared with one cubic centimetre of urine diluted one in one thousand had been covered with a profuse growth of *Bacillus coli*. In successive plates made in the same manner as treatment progressed the number of colonies had become less and less until finally the plates had been sterile. At the end of three months the urine had been still sterile, but six months after the institution of intravenous vaccine injections the patient had become affected by sub-acute rheumatoid arthritis in both knees and the urine had again contained *Bacillus coli*.

Dr. Forster said he would outline the clinical history of another patient as presenting particularly interesting features. A lady had developed acute rheumatoid arthritis which affected the right shoulder joint with especial severity. This joint had been extremely painful and had rapidly become rigid. Bacteriological examination of several teeth which seemed likely to be infected, had not revealed the presence of organisms. This patient had received a course of intravenous injections of *Bacillus coli* vaccine consisting of ten doses ranging from ten to two hundred millions at weekly intervals. Focal reaction, indicated by exacerbation of pain in the shoulder joint, had been definite and after each temporary aggravation the pain had been relieved. The joint had gradually become more movable, less painful and had appeared to get well. Soon afterwards this lady had manifested exophthalmos, tachycardia, tremor and slight thyreoid enlargement and he could not help feeling that the intravenous protein therapy had disturbed the balance of the internal secretions and caused the occurrence of exophthalmic goitre. Soon after the thyreoid condition had become established this patient had exhibited symptoms and local changes in the urine distinctive of pyelitis, the *Bacillus coli* again being the offending organism. He regarded this as another demonstration that intravenous injections of *Bacillus coli* vaccine produced no lasting immunity to the colon bacillus.

MR. W. KENT HUGHES (Melbourne) asked if Dr. Laurie had found intravenous injections of *Bacillus coli* vaccine effective in fibrosis as well as in rheumatoid arthritis. No doubt he paid attention to the septic foci which were frequently located in the tonsils and teeth.

He had treated a considerable number of the subjects of rheumatoid arthritis by diathermy applied after the eradication of septic foci and on the whole the results were very good. In fibrosis better results were obtained where the manifestations were acute than in those patients

in whom the trouble was chronic. He urged that diathermy was well worth a trial in rheumatoid arthritis; by its means he had obtained many cures which were apparently permanent.

DR. LAURIE, in the course of a brief reply to the discussion, said that he had obtained fairly good results in the treatment of pyelitis, but this condition was often very intractable and prone to recur, especially in women.

With reference to the occurrence of exophthalmic goitre in the patient described by Dr. Forster, Dr. Laurie said that he had never seen such a sequela of intravenous protein therapy.

He had curtailed his opening remarks and had not dwelt much on those cases in which the results had been disappointing. In general these were chronic in nature; he had not seen one patient in whom rheumatoid arthritis was acute and accompanied by fever, who did not respond very well. Of course he did not omit to search for infective foci. In acute rheumatoid arthritis the question arose as to whether it was better to remove septic foci at once or to await a degree of improvement in the general condition. He found on the whole that the better course to pursue was to give the vaccine injections first and have the septic foci eradicated when amelioration in the arthritis was effected. Infective foci must be dealt with by the appropriate measures, otherwise recurrence of arthritis was to be anticipated. He considered that there could be no question of the relationship of focal infections to rheumatoid arthritis and regarded myositis and fibrosis as also of infective origin.

VOTE OF THANKS.

At the conclusion of the evening session, DR. J. G. DESAILLY (Camperdown) moved a vote of thanks to those members of the Victorian Branch of the British Medical Association who had journeyed from Melbourne and provided extremely interesting papers. The members of the South-Western Division had greatly appreciated the instructive discussions and had thoroughly enjoyed the meeting in its social aspect.

DR. R. O. DOUGLAS (Hamilton) seconded the motion.

In conveying the resolution to the President of the South-Western Division, DR. H. I. HOLMES (Warrnambool) expressed the appreciation of the Division for the hearty cooperation of the Council of the Victorian Branch in the organization of the meeting.

SOCIAL EVENTS.

On March 7, 1925, the visiting members were taken by motor to Denniston, where they were conducted over the factory of Nestlé's Anglo-Swiss Condensed Milk Company, Limited, by the general manager, Mr. A. C. Munro, and his assistant, Mr. Corrie.

At the medical dinner, held at the Western Hotel on Saturday evening, all attending the meeting were the guests of Dr. H. I. Holmes.

At the conclusion of the evening session supper was served in the nurses' dining room at the Warrnambool Hospital. Appreciation of the hospitality of the Committee of Management and thanks to the Matron were expressed by Dr. A. L. Kenny.

Visitors were indebted to the Warrnambool members for an extremely enjoyable motor car drive on Sunday afternoon and to Miss Lake, of "Lyndoch," Warrnambool, who entertained them at afternoon tea in her delightful garden.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as members of the New South Wales Branch of the British Medical Association:

Vickery, Donald George Roberts, M.B., Ch.M., 1923
(Univ. Sydney), "Edina," Victoria Road, Bellevue Hill.

INVITATION TO MEET DR. W. N. ROBERTSON.

DR. W. N. ROBERTSON, C.B.E., the Vice-Chairman of the Federal Committee and Chairman of the Directors of The Australasian Medical Publishing Company, Limited, has been delegated by the Federal Committee to represent the medical profession of Australia at the opening ceremony of the new home of the British Medical Association in Tavistock Square, London. Dr. Robertson will make the presentation of the President's chair which is being constructed of Australian wood as a gift of the medical profession of Australia to the parent association.

The members of the British Medical Association are invited to meet Dr. Robertson at The Printing House, Seamer Street, Glebe, New South Wales, on Tuesday, April 28, at three o'clock in the afternoon, to wish him a successful voyage. At the same time they will have an opportunity of inspecting The Printing House.

Obituary.

CHARLES MACLAURIN.

It is with regret that we have to announce the death of Dr. Charles MacLaurin which occurred at Sydney on April 19, 1925.

Medical Appointments.

Dr. Ernest Chenoweth (B.M.A.) has been appointed Acting Government Medical Officer and Visiting Surgeon to His Majesty's Gaol, Mackay, Queensland.

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Dr. Otto Waldemar Mater has been appointed Acting Government Medical Officer at Thursday Island.

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Dr. Stephen Harold Cooke (B.M.A.) has been appointed Public Vaccinator at Nyah West, Victoria.

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Dr. F. G. Simpson has been appointed District Medical Officer and Public Vaccinator at Tambellup, Western Australia.

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Dr. Patrick Michael O'Meara (B.M.A.) has been appointed Acting Resident Magistrate and Acting Magistrate of the Local Court, Port Hedland; also Acting Chairman of the Port Hedland Court of Session, Western Australia.

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Dr. Albert Curtis (B.M.A.) has been appointed Acting Medical Superintendent of the Hospital for the Insane and the Receiving House, Ballarat, Victoria.

AMONG the names of those nominated for election as fellows of the Royal Society of Great Britain, is that of Professor F. Wood Jones, of Adelaide. This distinction is one of the highest that can be attained in the world of science and we offer Professor Wood Jones our warm congratulations.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

DEPARTMENT OF HEALTH, VICTORIA: District Health Officer. ST. GEORGE DISTRICT HOSPITAL, KOGARAH, SYDNEY: Honorary Consulting Physician.

UNIVERSITY OF SYDNEY: Lecturer in Clinical Obstetrics and a Demonstrator in Obstetrics.

ZEEHAN DISTRICT DISPENSARY AND MEDICAL UNION, TASMANIA: Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

| BRANCH. | APPOINTMENTS. |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney. | Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellow's Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. |
| QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane. | Brisbane United Friendly Society Institute. Stannary Hills Hospital. |
| SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide. | Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia. |
| WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |
| NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington. | Friendly Society Lodges, Wellington, New Zealand. |

Diary for the Month.

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| APR. 28.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee. |
| APR. 30.—New South Wales Branch, B.M.A.: Branch. |
| MAY 1.—Queensland Branch, B.M.A.: Branch. |
| MAY 5.—Tasmanian Branch, B.M.A.: Council. |
| MAY 6.—Victorian Branch, B.M.A.: Branch. |
| MAY 8.—Queensland Branch, B.M.A.: Council. |
| MAY 12.—New South Wales Branch, B.M.A.: Ethics Committee. |
| MAY 12.—Tasmanian Branch, B.M.A.: Branch. |
| MAY 14.—New South Wales Branch, B.M.A.: Clinical Meeting. |
| MAY 14.—Victorian Branch, B.M.A.: Council; Election of Representative on Representative Body. |
| MAY 15.—Western Australian Branch, B.M.A.: Council. |
| MAY 19.—Tasmanian Branch, B.M.A.: Council. |
| MAY 19.—New South Wales Branch, B.M.A.: Executive and Finance Committee. |
| MAY 19.—Illawarra Suburbs Medical Association, New South Wales. |
| MAY 20.—Western Australian Branch, B.M.A.: Branch. |
| MAY 21.—South Australian Branch, B.M.A.: Council. |
| MAY 22.—Queensland Branch, B.M.A.: Council. |
| MAY 26.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee. |
| MAY 27.—Victorian Branch, B.M.A.: Council. |

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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